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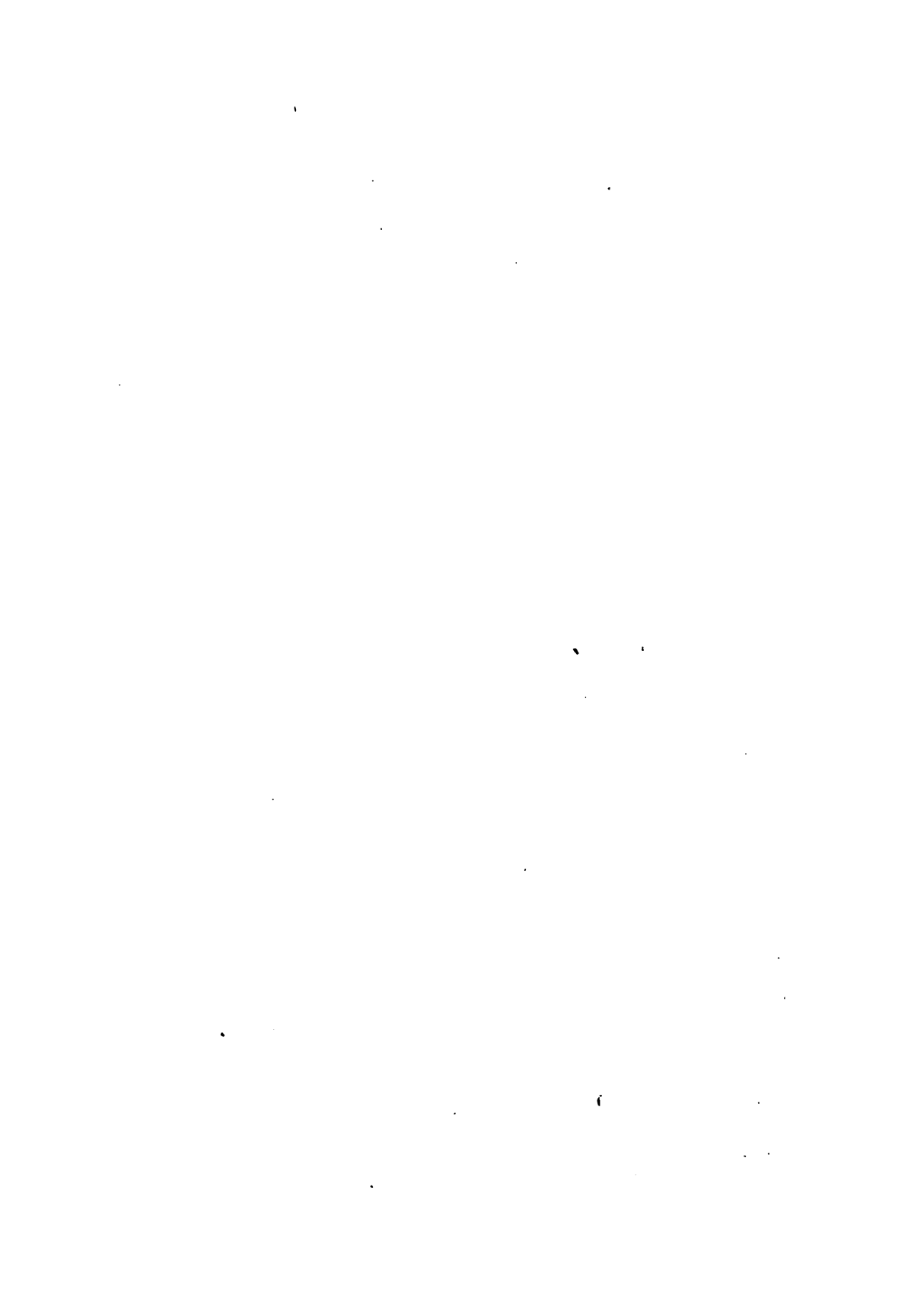
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ARGYNNIS EUPHROSYNE, AB.

By W. PARKINSON CURTIS.



THE above figure represents a variety of *Argynnis euphrosyne*, which I had the good fortune to capture on the 10th June, 1897, flying in a "ride" in Bere Wood, near Bloxworth, in the county of Dorset. It is a very fresh and quite perfect specimen (though late), the species being in full force here on the 20th of May.

On the upper surface the ground colour of the wings is not the usual fulvous brown, but a raw sienna colour. On the fore wings the usual markings are all present, but considerably emphasised, and most of them confluent. The spots along the outer marginal area of the wings are connected, forming reniform marks. The hind wings are almost entirely occupied by the dark brown colour, the outer marginal portions of the cells have a row of spots of the raw sienna colour centred with dark brown, and the usual pearl border is reduced by the encroachment of the dark brown to a series of triangular raw sienna-brown spaces.

On the under side the chief difference of the fore wings from the type is on the outer margin, where of the two usual rows of black spots the inner row only is present, the other row being converted into a series of conical darkish marks, the apex of each touching the corresponding dark mark of the inner row. On the hind wings the first two cells on the abdominal margin of the wings are entirely occupied by a dark greenish brown. All the usual silvery marks are present, but the space between the median and posterior marginal markings is almost entirely occupied by dark sienna-brown.

NOTES ON AQUATIC RHYNCHOTA. No. 1.

By G. W. KIRKALDY.

Fam. HYDROMETRIDÆ.

1. *Hydrometra greeni*, Kirk., n. sp.—Dark fawn colour; eyes black; length of head from eyes to apex nearly two and a third times greater than from eyes to base, wider between the antenniferous tubercles than at the base. Antennæ—first segment thicker apically than basally, not half the length of the second, which is not nearly half as long as the third. Hemelytra short, reaching to the base of the fifth abdominal segment; nervures pale violet brown. Femora reddish violet. Abdominis dorsum (except connexivum and genital segments) dark violet brown. Ventral surface pale fawn colour, destitute of silvery pubescence. Length 11.5 mm. Type, ♀; my collection.

Hab. Punduloya, Ceylon (*E. Ernest Green*, May, 1897).

Not unlike *H. stagnorum*, L., differing in the colour and in the proportions of the head and antennæ. The apical part of the head (anterior to the eyes) is longer than in the latter species, and the second antennal segment longer in proportion to the first. It is destitute, moreover, of the dense silvery pubescence which, in *H. stagnorum*, forms such a striking contrast to the prevailing black colouring.

H. greeni is the first true *Hydrometra* recorded from Ceylon, or indeed from the Oriental Region; *nitida*, *pectoralis*, and *discolor* referred to this genus by Mayr (Novara Reise, Hem. pp. 170–2) belonging to the genus *Gerris*.

2. The following species have apparently been omitted from Lethierry and Severin's 'Catalogue,' vol. iii.:—Page 54. *Hydrometra lineata*, Say? 1832, Descr. Het. Hem. (New Harm.), p. 35 (reprinted 1857, Trans. N.Y. Agric. Soc. p. 806, and 1869, Compl. Writ. i. p. 361) = *Limnobates lineata*, Uhl., 1894, Proc. Cat. Acad. Sci. (2) iv. p. 288. U.S.A. [With regard to Dr. Montandon's remarks (1896, Ann. Ent. Belge xl. 508) as to the correct date of Say's paper, it may be noted that no original copies appear to be extant, and that the date in the 1857 reprint may be an error.] Page 60. *Gerris canaliculatus*, Say, l. c. (reprints, pp. 807 and 363 respectively). Georgia.

Fam. GELASTOCORIDÆ.

It is probable that *Nerthra*, Say, l. c. (type, *N. stygica*, Say), should replace *Mononyx*, Lap., 1832, Mag. Zool. p. 16; but on account of the uncertain date of the former work, and the unsatisfactory description of the genus, it will be better, perhaps, to retain the latter name.

Fam. BELOSTOMATIDÆ.

1. *Pedinocoris macronyx*, Mayr. Prof. Carl F. Baker has

kindly lent me an imago and a larva of this species from Arizona, U.S.A. It has been seldom recorded, and seems scarce. Mayr (1863, Verh. z-b. Ges. Wien, xiii. pp. 347-51) gives a long description, with figures (pl. xi. f. 1-4), recording it from California and Mexico. In 1871, in the same journal (vol. xxi. p. 405), he mentions that the latter locality was a mistake. Prof. Uhler (1894, Proc. Cal. Ac. Sci. (2), iv. p. 292) records it from Lower California, but it does not appear to have been independently mentioned elsewhere. The maximum breadth of Prof. Baker's specimen exceeds that of the type (sec. descr.) by 2.5 mm.; the breadth of the base of the pronotum is 13 mm. None of the preparatory stages appear to have been known either to Mayr or other writers. The above-mentioned larva is in the ultimate stage and, as one would expect, differs very little from the imago beyond the customary shorter pronotum, absence of hemielytra, &c. The two large deep pronotal variolations are more pronounced, and the base of the pronotum is straighter in the larva. The "metasternal episternites" (Joanny Martin, Bull. Mus. Paris, Aug. 1896, p. 1 [sep.]) are present, and are of great size. Rhynchotists will await with great interest the results of M. Martin's researches upon these remarkable appendages.

This species should serve as the type of Mayr's genus.

Fam. CORIXIDÆ.

1. *Corixa holda*, n. n. for *Corixa fasciolata*, Heer, 1853, Insektenf. tertiärg. Oening. iii. 86 (nec Muls. Rey, 1852).

2. *Corixa hieroglyphica*, Duf. This species has a very wide distribution, practically the whole of the Palearctic Region, (including the Canary Isles), Yarkand, North America, &c., and Mr. Malcolm Burr has lately given me specimens (♀ ♀) from Assam (Chenapungi, Khasia Hills).

3. *Micronecta*, Kirk. In the last volume (p. 240) of the 'Entomologist,' I referred *Corixa albifrons*, Motsch., to the genus *Sigara*, stating that I did not know the species. Dr. Horváth has since kindly sent me two fine specimens from Ceylon, which he has determined as the above species, and which fully accord with the original description. On making fresh investigations, it appears that the examples are also, undoubtedly *Sigara siva*, Kirk. (Dr. Horváth has expressed his entire concurrence in this opinion), and I believe further that *Micronecta ovivora* (Westw.) is merely a bleached example of the same. The name "*striata*, Fieb.," which became dormant (Ent. 1897, p. 240) in *Sigara* is, as Dr. Horváth has pointed out, available for *Micronecta*, and the species will now be known as *Micronecta striata* (Fieb.).

It will be useful to briefly recapitulate the synonymy:—

Sigara striata, Fieb. (nec Fabr.).

Corixa albifrons, Motsch.

Corixa ovivora, Westw.

Sigara ovivora and *siva*, Kirk.

Moreover, "*lineata*, Fieb.," dormant in *Sigara*, must be revived for *Micronecta*, displacing *S. M-notata*, Kirk.

Although Fieber's description of *S. striata* (1844, Abh. böhm. Ges. Wiss. (5), iii. 292) is sufficiently precise, as far as it goes, his figure (pl. i. f. 22) is inaccurate, especially with regard to the pronotum, the lateral margins of which are "very short, . . . about one-seventh (roughly) of the middle breadth of the pronotum," but are scarcely indicated in the figure, and while the latter represents only one central transverse stripe on the pronotum, the diagnosis correctly indicates "Pronotum mit drei schwarzen Querlinien," this being amplified in the ensuing description. In consequence of this faulty figure, and the fact that it was not possible to examine the palæ of the male type of *ovivora*, I did not appreciate the conspecificity of these three species until after an examination of Dr. Horváth's specimens.

THE ASIATIC DISTRIBUTION OF BRITISH GEOMETRIDÆ.

(Concluded from vol. xxx. 316.)

MELANIPPE (CIDARIA) PROCELLATA, Fb. = *inquinata*, Butl.

Hydriomena procellata, Meyr.

Occurs in Amurland, Corea, Japan, Yesso, and Central and Western China.

Mr. Leech, referring to his series of this species from China, Japan, and Corea, states that "there are specimens which exactly agree with typical *procellata*; others are identical with *inquinata*, Butl.; and others again are almost unicolorous fuliginous brown. All these forms are connected by intergrades."

MELANIPPE (PLEMYRIA) RIVATA, Hb. = *supergressa*, Butl.

Specimens identical with European forms occur in Amurland, Japan, Yesso, and Corea.

MELANIPPE (PLEMYRIA) BICOLORATA, Hufn.

Occurs in Amurland, Japan, and Yesso.

"Japanese examples are larger, but do not otherwise differ from European specimens."

MELANTHIA (CIDARIA) ALBICILLATA, Linn.

Hydriomena albicillata, Meyr.

Recorded from Amurland, Japan, and Yesso.

Mr. Leech remarks:—"Except that they are generally rather larger, there is no important difference between Japanese examples (*casta*, Butl.) and European specimens of the same species. The discal spots are a trifle larger, and the marginal border of secondaries is uninterrupted."

CIDARIA PICATA, Hb.

Hydriomena picata, Meyr.

Occurs in Central and Western China.

"The specimens show variation in the width of the lines forming the central band, and also in the width of the white border of the band; in a large proportion of them the secondaries are devoid of marking on the upper surface. The examples from Central China are rather smaller than the majority of those from the west, and appear to be more constant in always having the band composed of broad and often confluent lines."—(Leech).

CIDARIA CORYLATA, Thnb. = *fabrefactaria*, Oberth.

Hydriomena corylata, Meyr.

Found in Amurland, Isle of Askold, and Japan.

The variation of the species in Eastern Asia is similar to that which occurs in European specimens.

[*Cidaria fulvata*, Forst. A close ally of this species is described by Mr. Leech from Western China under the name *Cidaria ochracearia*.]

[*Cidaria yokohamæ*, Butl. Mr. Leech thinks that this may possibly be an Eastern Asian form of *Anticlea* (*Cidaria*) *culculata*, Hufn.]

CIDARIA (LARENTIA) SUFFUMATA, Hb. = *minna*, Butl.

Hydriomena suffumata, Meyr.

This species is found in Western China, Japan, and Yesso.

Mr. Leech considers *C. minna*, Butl., from Japan, to be a small form of *C. suffumata*, and mentions that one of his Japanese specimens is only 24 millim. in expanse.

CIDARIA (LARENTIA) TRUNCATA, Hufn.

Hydriomena truncata, Meyr.

This species is represented in E. Siberia, Amurland, Isle of Askold, Japan, Yesso, Kiushiu, and Western China by forms that are somewhat similar to, although not exactly identical with, some of those occurring in Europe.

CIDARIA (LARENTIA) IMMANATA, Haw.

Occurs in Central and Western China, Japan, and Yesso.

The type and var. *marmorata* are each represented, and some of the specimens approach var. *thingvallata*, Staud.; the latter are from Nemora in the north of Yesso.

Mr. Meyrick and Sir George Hampson treat this species as a form of *C. truncata*.

CIDARIA SILACEATA, Hb.

Hydriomena silaceata, Meyr.

This species is found in Amurland, Japan, Kiushiu, and Central and Western China.

Central Chinese specimens range from 26-34 millim., and Western Chinese from 30-38 millim. in expanse. Howkow examples have typical fore wings; but the hind wings are almost entirely without marking.

A form from Western China, described as var. *angustaria*, Leech, has all the wings narrower than the type; both surfaces are heavily suffused with fuliginous, and the white transverse lines of fore wings are strongly defined.

CIDARIA (EUSTROMA) RETICULATA, Hb.

Recorded from E. Siberia, Amurland, Korea, Japan, Yesso, Central and Western China, and Sikkim.

Mr. Leech states: "In China and Japan this species is generally represented by *aerosa*, Butl., which is identical with *inextricata*, Walk., but I have typical specimens from Hakodate, Omei-shan, and Chia-kow-ho."

CAMPTOGRAMMA (CIDARIA) FLUVIATA, Hb.

Hydriomena fluviata, Meyr.

Occurs in Eastern and Western China, Japan, Korea, India, Ceylon, and Burma.

COREMIA (CIDARIA) DESIGNATA, Hufn.=*propugnata*, Fb.

Xanthorhoe designata, Meyr.

Recorded from E. Siberia, Amurland, Japan, and Yesso. Specimens agree with European examples.

COREMIA (CIDARIA) QUADRIFASCIARIA, Clerck=*ignobilis*, Butl.

Xanthorhoe quadrifasciaria, Meyr.

Occurs in Amurland, Japan, and Yesso.

Referring to Japanese specimens, Mr. Leech says some are much suffused; "others agree with the type of '*S*' *ignobilis*, Butl., in the National Collection at South Kensington."

ANTICLEA (LARENTIA) BADIATA, Hb.

Hydriomena badiata, Meyr.

"The central fascia of primaries and the secondaries are whiter in Japanese specimens than in any example in my European series" (Leech).

Only recorded from Japan.

EMMELESIA (LARENTIA) TÆNIATA, Steph.=*fulvida*, Butl.

Hydriomena tæniata, Meyr.

Occurs in Western China, Japan, Yesso, and Kiushiu.

"In the Japanese specimens the central band of primaries is broader than in European examples; and the space between this band and the basal patch is deeply suffused with fuliginous" (Leech).

HYPsipETES (LARENTIA) SORDIDATA, Fb.=*clutata*, Hb.

Hydriomena clutata, Meyr.

Occurs in Amurland, Japan, and Western China.
Specimens are of forms similar to those occurring in Europe.

Thera (Larentia) variata, Schiff.

Hydriomena variata, Meyr.

Modifications of the *obeliscata* form occur in Japan, Corea, and North-east China.

[*Larentia comis*, Butl., from Japan, is very like some European *T. (L.) variata*, but the antennæ are shortly bipectinate.]

[*Oporabia dilutata*, Bork., is replaced in Japan by a very closely-allied species, *O. nexifasciata*, Butl.]

EUPITHECIA CASTIGATA, Hb.

Tephroclystis castigata, Meyr.

Occurs in Amurland, Japan, and Western China.

EUPITHECIA CORONATA, Hb.

Chloroclystis coronata, Meyr.

Mr. Butler has described this species from Japan as *E. lucinda*. The specimens do not differ from European examples.

[*Eupithecia rectangulata*, Linn. — Mr. Leech is of opinion that *Lobophora julia*, Butl. = *Chloroclystis palpata*, Hampson, may probably be an Eastern Asian representative of this species.]

LOBOPHORA HALTERATA, Hufn. = *hexapterata*, Schiff.

Occurs in Amurland and Yesso. Typical.

LOEOPHORA (TRICHOPTERYX) VIRETATA, Hb.

Mr. Leech has one female specimen from Ta-chien-lu, Western China; taken in May.

ASTHENA (HYDRELIA) SYLVATA, Hb.

Euchoæa sylvata, Meyr.

Occurs in Amurland and Japan. Typical.

ASTHENA (HYDRELIA) BLOMERI, Curtis = *pulchraria*, Eversm.

Euchoæa blomeri, Meyr.

Recorded from Amurland and Japan.

Mr. Leech refers to one specimen, from Pryer's collection, in which "the only character that shows up at all prominently is the short brownish fascia."

ASTHENA (HYDRELIA) LUTEATA, Schiff.

Euchoæa luteata, Meyr.

There were two specimens in Pryer's Japanese collection, and these Mr. Leech states are paler than his European examples.

The species also occurs in Amurland and the Isle of Askold.

ASTHENA CANDIDATA, Schiff.

Occurs in Amurland, Japan, Yesso, Corea, Central and North-east China. Typical.

EUPISTERIA (HYDRELIA) OBLITERATA, Hufn. = *hepararia*, Hb.
Euchæca obliterata, Meyr.

Recorded only from Japan. Typical.

VENUSIA CAMBRICA, Curtis.

Occurs in Japan. Typical.

MINOA MURINATA, Scop. = *euphorbiata*, Fb.

Asthenes murinata, Meyr.

Mr. Leech has one male specimen from Japan. This is referable to var. *cyparissaria*, Mann.

Subfamily ACIDALIINÆ.

ACIDALIA ORNATA, Scop.

Craspedia ornata, Meyr.

This species is found in Amurland and Japan. Mr. Leech remarks that "the blotches on outer area of the wings are less distinct in Japanese than in European specimens."

ACIDALIA STRIGILARIA, Hb.

Leptomeris strigilaria, Meyr.

Common in Japan; also occurs in Amurland, Kiushiu, Corea, Central, Western, and Northern China.

ACIDALIA FUMATA, Steph.

Leptomeris fumata, Meyr.

Occurs in Amurland, and Mr. Leech states that there was a specimen in Pryer's Japanese collection which he considered referable to this species.

ACIDALIA REMUTARIA, Hb.

Leptomeris remutaria, Meyr.

Recorded from Amurland and Japan.

ACIDALIA STRIGARIA, Hb.

Leptomeris strigaria, Meyr.

Occurs in Amurland, Japan, and Corea.

ACIDALIA BISETATA, Hufn.

Eois bisetata, Meyr.

Has been found in East Siberia, Amurland, Japan, Kiushiu, Corea, Central, Western, and North-eastern China.

TIMANDRA AMATARIA, Linn.

Calothyssanis amataria, Meyr.

"Very variable and generally distributed throughout Japan." It also occurs in Central and Western China.

Subfamily GEOMETRINÆ.

PSEUDOTERPNA PRUINATA, Hufn. = *cytisaria*, Esp.

Alphéraky describes as var. *simplex* a large greenish white form without markings from Western China.

HEMITHEA STRIGATA, Müll.

Nemoria strigata, Meyr.

Occurs in Amurland, Japan, Yesso, Kiushiu, Corea.

GEOMETRA PAPILIONARIA, Linn.

Occurs in East Siberia, Amurland, Japan, and Yesso. Typical.

NEMORIA VIRIDATA, Linn.

Has been recorded from Amurland and Corea, and Mr. Leech refers specimens received from Central and Western China to this species.

IODIS (THALERA) LACTEARIA, Linn.

Euchloris lactearia, Meyr.

Occurs in Amurland, Corea, Yesso, and North-eastern China.

A CATALOGUE OF THE LEPIDOPTERA OF IRELAND.

By W. F. DE VISMES KANE, M.A., M.R.I.A., F.E.S.

(Continued from vol. xxx. 312.)

HYPISIPETES TRIFASCIATA, *Bork.* — Although the alder is so common a tree in all parts of Ireland, this species, so far as my experience goes, appears to be somewhat localized. It presents the usual wide range of variation, sometimes with a dark green ground colour (*W.*); but I have not met with the almost unicolorous brown form. A very remarkable variation I have from Drumreask and near Favour Royal, Tyrone, has a whitish ground colour with very little dusting of dark scales, traversed by two slight scalloped lines across the central and basal areas. The fringes are dusky, and on the costa one or two dark marks, indicating other suppressed transverse bars. Judging from the rather small Irish series I possess, the Irish insect seems to tend toward pale rather than dark forms. Localities: The Rev. J. Greene found pupæ under moss on alder-trees at Rathfarnham, Co. Dublin (*B.*); Powerscourt, Co. Wicklow, abundant; Howth (*G. V. H.*); Favour Royal, Co. Tyrone; Drumreask, Co. Monaghan; Enniskillen (*A.*) and Tempo Manor (*Langham*); Cromlyn, Co. Westmeath (*Mrs. B.*); Sligo (*Russ.*); Derry, abundant (*C.*); Colin Glen, &c., near Belfast, very numerous (*W.*); Castle Bellingham, Co. Louth (*Thornhill*).

HYPISIPETES SORDIDATA, *Fb.* — One of our most abundant moths, and as variable here as elsewhere in the United Kingdom. Only one of the ab. *fusco-undata* has come under my notice, from Farnham, Cavan. The var. *infuscata*, *Stgr.*, has not yet been recorded from Ireland. At Altadiawan, Tyrone, I took a number of the larvæ, nearly full-fed, from bilberry (*Vaccinium myrtillus*),

and reared them on that food; but the imagines were in no way remarkable, except for their somewhat inferior size, a result which might have occurred through irregularity in feeding.

MELANTHIA BICOLORATA, *Hufn.*—Generally distributed and in many places very numerous, as at Ardtully, near Kenmare, Tempo Manor, near Enniskillen (*Langham*), and at Enniscooe, Crossmolina, Co. Mayo. The chief variation is shown in the median band, which is often not developed except in a large costal blotch. This sometimes is connected with a small one on the inner margin by a dot or two; and rarely specimens occur with the band complete from margin to margin. The var. *plumbata* has not yet been observed. "Dublin and Wicklow, not uncommon" (*B.*); Glenarm, common (*W.*), and Antrim; L. Neagh and Armagh (*J.*); Derry (*C* and *W. E. H.*); Carrablagh (*G. V. H.*), Cloghan and Stranorlar, Co. Donegal; Favour Royal, Tyrone; Enniskillen (*A.*); Castle Bellingham, Co. Louth (*Thornhill*); Cromlyn (*Mrs. B.*) and Killynon (*Miss R.*) Co. Westmeath; Greystones, Co. Wicklow; Clonbrock, Co. Galway, common (*R. E. D.*); Mallow, Co. Cork (*Stawell*).

MELANTHIA OCELLATA, *L.*—Widely spread and not rare. No important varieties have been observed. The apical area and the white extra-basal band vary in the amount of marking, and there is often a warm ochreous tinge on the outer marginal white band. It is unnecessary to give localities, as it occurs in most districts, though not often very numerous.

MELANTHIA ALBICILLATA, *L.*—This handsome insect is far more local than the preceding, and though generally somewhat scarce, is in some woodlands fairly numerous. Its distribution is very extensive. It varies greatly in expanse, from about one inch to one and three-eighths, but no variation of any importance occurs, though the shading along the outer margin differs in degrees of strength. "Wicklow, Kerry, and Galway" (*B.*). In the latter county it is found at Kilcornan, Ardahan (*Miss N.*) and Kylemore (*Hon. E. L.*); Donard demesne, &c., Co. Down (*W.*); Derry (*W. E. H.*); Stranorlar, Co. Donegal; Markree Castle, shores of L. Arrow, and near Sligo (*Russ*); Cromlyn (*Mrs. B.*) and Killynon (*Miss R.*), Co. Westmeath; Drumreaske, Monaghan; Favour Royal, Co. Tyrone; Armagh (*J.*); Enniscorthy, Co. Wexford; near Kenmare and Crookhaven, Co. Kerry; Cappagh, Co. Waterford; Mallow, Co. Cork (*Stawell*).

MELANIPPE HASTATA, *L.*—Local, but often fairly plentiful in its haunts. Somewhat variable; the median black band and that along the outer margin being sometimes much broken up and attenuated. The general Irish form has the white median band of both wings broad, rarely bearing a series of spots, but usually devoid of them or with only a few traces, and sharply

defined by the black bands. Occasional aberrations occur with the type, however, in which the basal halves of the wings are white, ornamented by black spots and irregular streaks in place of the usual black band; and the black marking on the outer margin much diminished. The small Scottish forms from Sutherland, Isle of Lewes, &c., and also from Yorkshire, in which the white bands are reduced in size and bear a well-marked series of spots (as represented in the second illustration in Newman's 'British Moths'), has not yet been noticed in Ireland. Our small examples tend, like the rest, to an increase of the white pattern. This northern variety appears to be the var. *subhastata*, Nolck., of Sven Lampa's Cat. Scand. Lep. A variety even more obscured by black than the above was sent me from Scandinavia, in which the basal halves of the wings are black with interrupted white lines, and the white median band as narrow as that of the smaller species, *M. tristata*, and heavily spotted. In fact, with a larger expanse, its character approximates closely to the latter species, and appears to be a transitional form, and may be referable to var. *gothicata*, Gn. Thus it would appear that a well-marked gradation of characters is developed under the influence of northern climates; so that this species seems worthy of more attention than it has yet received from students of melanic phenomena. Irish specimens, however, bear a distinctly southern impress. Killarney (Toomies and Cromaglaun), Kenmare, Sneem, and elsewhere in Kerry, fairly plentiful; Ballyvourney and Macroom, Co. Cork; Kylemore (*Hon. E. L.*), Ballynabinch, Merlin Park, Clonbrock, Ardrahan, &c., Co. Galway; Sligo (*W.*); common near Tempo Manor, Enniskillen (*Langham*); Altadiawan, Tyrone; Kilderry (*C.*) and Buncrana (*Milne*), near Derry; and I have met with it in great numbers at Pontoon, on the shore of L. Conn, Mayo.

MELANIPPE TRISTATA, L.—A very local species, though numerous in its haunts. Irish specimens have the black bands of the basal half of the wings pale, and generally much broken up with white; and the white transverse band broad. A Scandinavian specimen in my cabinet has the basal half of the wing deep black, traversed by two white striæ, and the outer marginal black band very broad and dark, with a few white spots. I have a few similar English examples. A curious aberration from Powerscourt, Wicklow, has all the white ground suffused with rusty yellow, and the black markings very pale and broken up. Tinahely (*Bw.*), Kippure and Powerscourt, Co. Wicklow; Claring Bridge (*B.*), Kylemore (*Hon. E. L.*), and Ardrahan, Co. Galway; Enniskillen (*A.*); mountain above Tollymore Park, Knockagh, near Carrickfergus (*W.*); Cappagh, Co. Waterford.

MELANIPPE UNANGULATA, Haw.—Very local and uncommon. Belfast (*Bw.*); Enniskillen, one (*Col. Partridge*); Cappagh, Co.

Waterford; Clonbrock, a few (*R. E. D.*); Ardtully and mountains above Kenmare, Co. Kerry.

MELANIPPE RIVATA, *Hb.*—Very rare and local. I have never taken it. "Cork, Mr. Clear" (*B.*); Clonbullogue, King's Co. (*E. S.*); Galway, a few (*A.*).

MELANIPPE SOCIATA, *Bork.*—One of our most numerous Geometers, unstable in its character, especially in the width of the white submarginal band, and the outline and colour of the dark median band.

(To be continued.)

A LIST OF THE HYMENOPTERA-ACULEATA OF THE IPSWICH DISTRICT.

BY CLAUDE MORLEY, F.E.S., &c.

THE collection of the Aculeates was never a very strong point with me until my friend Rev. E. N. Bloomfield, M.A., F.E.S., proposed drawing up a list of those species which occurred in the county of Suffolk, and I then did what I could to assist him in so congenial a study, in view of the shortly expected publication of which I can say but little here without poaching upon his preserves. The cradle of Anthophilology was rocked in this District by Rev. William Kirby, M.A., F.R.S., &c., rector of Barham, just a hundred years ago, and, in setting forth my own experience side by side with his, I think the contrast will but show that, when Entomology as a whole was hardly shortcoated, this pioneer was already a "man among men." This being so, it is hardly wonderful that within a radius of five miles of Ipswich town more species should be enumerated, thanks to him, than have been recorded in some cases from a whole county. One or two of these, however, have not been observed within seven miles, and a couple of the *Megachile* occur no nearer than Felixstowe, which is ten as the crow flies. These, however, are the only exceptions. That there are species, especially among the Fossores, at this moment disporting themselves upon the blackberry blossoms and luscious Umbelliferæ, carrying spiders and caterpillars to their nests in sand-banks, posts, and dead twigs, that have not their names enrolled in this list, there can be no doubt; but, since it is an obvious impossibility to include the whole, and the list is now (I think) as long as others of the same scope, it would appear that this classic corner of East Anglia is to be anything but despised as a hunting-ground for these the most intelligent insects; and we trust that the following list may induce some of our lepidopterists also to embrace *this exceedingly interesting branch*, and those who have never

handled the subtle net to go out into the highways and hedges and "look through Nature up to Nature's God."

Excluding races and varieties, the list comprises the following species:—Heterogyna, 10; Fossores, 53; Diploptera, 10; Anthophila, 133. Total, 206.

HETEROGYNA.

FORMICA, Linn.

1. *rufa*, Linn.—There has been a strong nest in the Bentley Woods for the last six years, and at one time there were two, in which many myrmecophilous Coleoptera occur.

2. *fusca*, Linn.—Generally common on sandy banks.

LASIUS, Fab.

3. *fuliginosus*, Latr.—Barham, abundant (*Rothney*); common, often hibernating beneath oak bark.

4. *niger*, Linn.—The common garden ant; abundant.

" race *alienus*, Först.—Common on the sandhills at Felixstowe in June.

5. *umbratus*, Nyl.—Not uncommon; Barren and Foxhall Heaths.

6. *flavus*, De Geer.—Nests commonly in old pastures.

LEPTOTHORAX, Mayr.

7. *tuberculatum*, Fab., race *nylanderi*, Foerst.—Somewhat local, but very common in the winter beneath the bark of aspen, maple, &c.; Wherstead, Bentley, Blakenham, &c.; by the Gipping at Claydon, &c.

STENAMMA, West.

8. *westwoodi*, West.—One specimen in moss from Bentley Woods, 30 × 97.

MYRMICA, Latr.

9. *rubra*, Linn., race *ruginodis*, Nyl.—Not uncommon.

" " *lavinodis*, Nyl.—Common.

" " *scabrinodis*, Nyl.—Common.

" " *lobicornis*, Nyl.—Rare; one hermaphrodite in sandpit at Foxhall, August, 1896.

MONOMORIUM

10. *pharaonis*, Linn.—An imported species; only too common in a baker's shop in Ipswich; also swept from hedges at Wherstead.

FOSSORES.

MUTILLA, Lyn.

11. *rufipes*, Ltr.—Rare; a couple of females at Bentley Woods in August, 1897.

MYRMOSA, Latr.

12. *melanocephala*, Fab.—Singly; always in sandy places; Bentley Woods, male and female; Bixley and Foxhall, females.

TIPHIA, Fab.

13. *femorata*, Fab.—Ipswich and Barham (*Rothney*).

AGENIA, Schiöde.

14. *hircana*, Fab.—Rare; one swept near Clopton Church, July, 1897.

SALIUS, Fab.

15. *fuscus*, Linn.—Not uncommon in the spring.

16. *exaltatus*, Fab.—Sparingly since 1893.

17. *pusillus*, Schiöde.—Rare; in the spring in Bentley Woods.

18. *parvulus*, Dhlb.—One female in a sandpit at Bentley Woods, August, 1896.

POMPILUS, Fab.

19. *plumbeus*, Fab.—Not uncommon at Bixley in August.
 20. *chalybeatus*, Schiödte.—Rare; Foxhall, and at Felixstowe, flying on the sands.
 21. *gibbus*, Fab.—Belstead, Foxhall, Ipswich, and Bentley Woods, singly.
 22. *unguicularis*, Thoms.—Uncommon; Wherstead and Foxhall in 1896.
 23. *pectinipes*, V. d. Lind.—The commonest of the genus, and widely distributed.

TRYPOXYLON, Latr.

24. *figulus*, Linn.—Not very common.
 25. *clavicerum*, Lep.—Abundant; the genus is always taken flying to their nests in posts.
 26. *attenuatum*, Sm.—Uncommon; Dodnash Wood and Clopton.

TACHYTES, Panz.

27. *pectinipes*, Linn.—Rare; one on Umbelliferæ, Ipswich, 1896.

AMMOPHILA, Kirb.

28. *sabulosa*, Linn.—Sparingly since 1893.
 29. *hirsuta*, Scop.—Martlesham Heath (*Kirby*).
 30. *lutaria*, Fab.—Martlesham Heath, two females (*Kirby*).

STIGMUS, Jur.

31. *Solskyi*, Moraw.—Rare; one at Great Bealings, flying to nest in post.
 DIODONTUS, Curt.
 32. *tristis*, V. d. Lind.—Common; flying to nests in sandbanks; Grandisburgh, Bentley Woods, &c.

PASSALÆCUS, Shuck.

33. *cornigera*, Shuck.—Common.
 34. *insignis*, V. d. Lind.—Common in woods about Bentley.
 35. *gracilis*, Curt.—Rare; at flowers on the banks of the Gipping.
 36. *monilicornis*, Dbm.—Both sexes flying to nests in palings; Ipswich, June 22nd, 1896.

PEMPHREDON, Latr.

37. *lugubris*, Fab.—Rare; Bentley Woods.
 38. *shuckardi*, Moraw.—Not common on the banks of the Gipping and at Foxhall.

MIMESA, Shuck.

39. *bicolor*, Jur.—One only; on umbels at Bentley Woods, in 1894.

GORYTES, Latr.

40. *tumidus*, Panz.—Local; Bramford, Foxhall, and Bentley Woods.
 41. *mystaceus*, Linn.—Uncommon; Bentley Woods and Blakenham.

NYSSON, Latr.

42. *spinus*, Fab.—Taken by Mr. Baylis and myself at Bentley Woods in 1894, but not seen in the District since.
 43. *dimidiatus*, Jur.—Rare; Bentley Woods and Foxhall, singly.

MELLINUS, Fab.

44. *arvensis*, Linn.—Common.

CERCERIS, Fab.

45. *labiata*, Fab.—Singly at Baylham, Bentley Woods, Bramford, and Little Blakenham, on *Spiræa ulmaria* and *Achillea millefolium*.

CRABRO, Fab.

46. *capitosus*, Shuck.—Ipswich; bred from bramble stems (*Rothney*).

47. *leucostoma*, Linn.—Rarely; at Bentley Woods and Great Blakenham.
 48. *podagricus*, V. d. Lind.—Flying, like the rest of the genus, to posts in which they nest, at Ipswich and Great Bealings.
 49. *palmipes*, Linn.—Not uncommon; Ipswich, Foxhall, Clopton, and Great Bealings.
 50. *varius*, Lep.—Rare; a single specimen in Bentley Woods.
 51. *wesmaeli*, V. d. Lind.—Rarely; on umbels at Ipswich.
 52. *elongatulus*, V. d. Lind.—By no means common; Foxhall, &c.
 53. *4-maculatus*, Fab.—Common; about here it burrows in sandpits, and not in rotten wood (Saunders's 'Hymenoptera,' p. 137).
 54. *cribrarius*, Linn.—Common.
 55. *peltarius*, Schreb.—Common.
 56. *vagus*, Linn.—Very rare; one at a sandbank, Dodnash Wood.
 57. *cephalotes*, Panz.—Not very common; Ipswich and Grundisburgh.
 58. *chrysostoma*, Lep.—Somewhat common.
 59. *lituratus*, Panz.—One specimen on umbels near Ipswich in 1894.
 60. *albilabris*, Fab.—Occasionally on flowers at Ipswich.

ENTOMAGNATHUS, Dhlb.

61. *brevis*, V. d. Lind.—Common.

OXYBELUS, Latr.

62. *uniglumis*, Linn.—Common.

DIPLOPTERA.

VESPA, Linn.

63. *crabro*, Linn.—Not too common; a strong nest in a garden in the Westerfield Road, Ipswich, in 1894.
 64. *vulgaris*, Linn.—Common, and harbouring many species of inquiline Coleoptera in its nests, e. g. *Metacus paradoxus*, *Haploderus celatus*, *Rhizophagus ferrugineus*, *Cryptophagus pubescens*, &c.
 65. *germanica*, Fab.—Common.
 66. *rufa*, Linn.—Not common; Bentley Woods and Hadleigh.
 67. *sylvestris*, Scop.—Somewhat common.

ODYNERUS, Latr.

68. *callosus*, Thoms.—Somewhat common.
 69. *parietum*, Linn.—Rare; one in my study, June 30th, 1897.
 70. *trifasciatus*, Oliv.—Rare; one near Ipswich in June, 1896.
 71. *gracilis*, Brullé.—Rare; a female on *Spiræa ulmaria* at Baylham.
 72. *sinuatus*, Fab.—The commonest of the genus, curiously enough; an old gate-post in Bentley Woods generally harbours a large colony.

ANTHOPHILA.

COLLETES, Latr.

73. *succincta*, Linn.—Rare; Foxhall Crag Pits.
 74. *fodiens*, Kirb.—"Barhamiæ, in floribus Jacobææ" (Kirby); Rushmere (Harwood); common on ragwort at Foxhall.
 75. *picistigma*, Thoms.—Rare; a female at Bentley Woods in 1897.
 76. *daviesana*, Sm.—Abundant at nests in a sandbank, Bentley Woods, &c.

PROSOPIS, Fab.

77. *dilatata*, Kirb.—Barham (Kirby).
 78. *communis*, Nyl.—Barham (Kirby); common.
 79. *signata*, Panz.—Barham (Kirby).
 80. *confusa*, Nyl.—One on *Rubus* flowers in Bentley Woods.

81. *brevicornis*, Nyl.—One on Umbelliferæ in Bentley Woods, 1896.
SPHECODES, Latr.
82. *gibbus*, Linn.—Barham (Kirby); not common; Bramford and Great Bealings in 1897.
83. *subquadratus*, Sm.—Not uncommon; Great Bealings, Bentley Woods, &c.
84. *pilifrons*, Thoms.—Somewhat common on *Achillea millefolium*.
85. *similis*, Wesm.—Common.
86. *puncticeps*, Thoms.—Uncommon; Foxhall and Bentley Woods.
87. *dimidiatus*, v. Hag.—The commonest of the genus, and ubiquitous on flowers in August.
88. *affinis*, v. Hag.—Not uncommon.
HALICTUS, Latr.
89. *rubicundus*, Chr.—Barham (Kirby); common on flowers.
90. *xanthopus*, Kirb.—Barham (Kirby).
91. *leucozonius*, Schr.—Barham (Kirby); common on flowers.
92. *quadrinotatus*, Kirb.—Barham (Kirby); common.
93. *lævigatus*, Kirb.—Barham (Kirby).
94. *sextnotatus*, Kirb.—Frequent in flowers at Barham in the autumn (Kirby).
95. *cylindricus*, Fab.—Barham; frequent (Kirby); very common.
96. *albipes*, Kirb.—Barham (Kirby); rather common.
97. *subfasciatus*, Nyl.—Probably rare; two specimens on flowers in the Bramford marshes in August, 1897.
98. *villosulus*, Kirb.—Barham, very rare (Kirby); uncommon, Little Blakenham.
99. *lævis*, Kirb. — "Barhamiæ semel capta, iterum in Nacton, Suffolciæ" (Kirby); the only British records — about a hundred years old!
100. *minutus*, Kirb.—Barham (Kirby); uncommon, Clopton, Bramford, and on the banks of the Orwell.
101. *nitidusculus*, Kirk.—Barham (Kirby) abundant, the commonest species of the genus in this district.
102. *punctatissimus*, Schk. — Very rare; one female on flowers at Foxhall, May, 1897.
103. *minutissimus*, Kirb.—Frequent on flowers and roadside banks at Barham (Kirby); not very common.
104. *tumulorum*, L.—Barham (Kirby); common of flowers of *Achillea millefolium* in August.
105. *smeathmanellus*, Kirb.—Many nests in a low wall surmounted by an iron railing in the Burrell Road, Ipswich; it also occurs at Bramford and Burgh.
106. *morio*, Fab.—Barham (Kirby); not very common; Bentley, and on the banks of the Orwell.
107. *leucopus*, Kirb.—Abundant on flowers in July and August.
ANDRENA, Fab.
108. *cetii*, Schr.—"Barhamiæ; Coddenshamiæ, prope Needham Market in Suffolciâ, bis capta" (Kirby).
109. *cingulata*, Fab.—"Barhamiæ, femina in floribus Ranunculosi bulbosi" (Kirby); very rare, one on umbels in 1894.
110. *albicans*, Kirb.—Barham (Kirby); common.

111. *pilipes*, Fab.—Barham (*Kirby*).
112. *atriceps*, Kirb.—“*Barhamiæ*, in floribus *Taraxaci*” (*Kirby*); not uncommon on flowers in April.
113. *bimaculata*, Kirb.—Twice taken at Barham (*Kirby*); common.
114. *florea*, Fab.—One female at bramble-flowers in Bentley Woods on Aug. 3rd, 1896.
115. *rosa*, Panz.—Uncommon; Bentley Woods and Foxhall.
var. *trimmerana*, Kirb.—Very common.
116. *thoracica*, Fab.—Barham (*Kirby*).
117. *nitida*, Fourc.—Frequent at Barham (*Kirby*); East Bergholt (*Harwood*).
118. *fulva*, Schr.—Barham (*Kirby*); common; Shrubland Park, &c.
119. *clarkella*, Kirb.—Rare; Ipswich; only taken in 1894.
120. *nigroanea*, Kirb.—Barham (*Kirby*); somewhat common, appears in April.
121. *gwynana*, Kirb. (1st brood).—Barham (*Kirby*); abundant in April at flowers of *Leontodon*, &c. Kirby's dedication is interesting:—“*Memoriæ botanici periti, tum et naturæ, scrutatoris indefessi, mihi et omnibus Historiæ Naturalis cultoribus semper amicissimum se præbentis, Nicolai Gwyn, M.D. Gippovicensis, hoc insectum dicatum volo.*”
bicolor, Fab. (2nd brood).—Much rarer than the first brood; Foxhall, &c.
122. *angustior*, Kirb.—“*Mas Barhamiæ lectus*” (*Kirby*).
123. *præcox*, Scop.—“*Barhamiæ*, in salicum amentis masculis frequens anno 1799” (*Kirby*).
124. *varians*, Rossi.—“*Capta semel in floribus P. Mali in horto quodam Gippovicensi*” (*Kirby*).
125. *helvola*, Linn.—Barham (*Kirby*).
126. *nigriceps*, Kirb.—Barham in 1800 (*Kirby*); not uncommon at Bentley Woods.
127. *denticulata*, Kirb.—Rarely in flowers at Barham (*Kirby*).
128. *fuscipes*, Kirb.—Barham; very rare (*Kirby*); still very rare, one specimen at Ipswich in 1893.
129. *tridentata*, Kirb.—Melton and Barham; very rare (*Kirby*).
130. *fulvicrus*, Kirb.—Infrequent at Barham (*Kirby*).
131. *albicrus*, Kirb.—Barham (*Kirby*); uncommon, Foxhall and Ipswich.
132. *chrysosceles*, Kirb.—Barham; rare (*Kirby*); uncommon, Ipswich and Blakenham.

(To be continued.)

NOTES AND OBSERVATIONS.

HELIOTHIS ARMIGERA.—This species is a true cosmopolitan. It occurs in Europe, Asia, Africa, America, and Australia. It was first introduced as British by Mr. Edleston, who in the ‘*The Zoologist*’ for 1843 (p. 260) recorded a specimen taken at Salford, by Mr. John Thomas, in September, 1840. This capture is referred to in the list of “*New British Species since 1835*,” published in the ‘*Entomologist*’s

Annual' for 1855 (p. 38), where also are mentioned a specimen taken at Mickleham, and others "taken in various localities." In 1856 one was obtained at Exeter, and one in the Isle of Wight. The summer of 1859 was a hot one, as were the two previous summers, and many records of the occurrence of *H. armigera* were enumerated in the 'Annual' for 1860; the localities being Brighton, Bristol, Cambridge, Edmonton, Isle of Wight, Ramsgate, Torquay, Weston-super-mare, Worthing, and other places. Between the year last mentioned and 1871 one specimen or more seem to have been captured each year, and chiefly on the south and south-west coasts, but one example was reported from Scarborough in 1866, and one from Wakefield in 1871. Turning now to the 'Entomologist' I do not find any further records until 1876, when a specimen occurred at Bristol, and in the following year three captures were announced—one at Hartlepool, one in Gloucestershire, and one on the Kentish coast. In 1881 there is another Gloucestershire record; in 1890 the occurrence of a specimen at Chatham is reported; in 1895 one example is notified from Tunbridge Wells; and, finally, we have the capture mentioned by Mr. Druitt in the present number. Mr. J. Jenner Weir, in 1869, bred two specimens from larvæ found feeding on tomatoes, and mentioned, when exhibiting them before the Entomological Society of London, that an importation of tomatoes from Spain and Portugal had been greatly damaged by a number of green larvæ, with black lines and spots, which fed in the fruit.

Twenty-three years later Mr. Arkle (Entom. xxv. 297) again refers to the importation of *H. armigera* in the larval state in consignments of tomatoes from Valencia arriving at Liverpool in the months of June and July. The moths in this case appeared on July 27th (two) and Aug. 15th (one). The same writer (Entom. xxvii. 138) records two imagines, bred July 9th, from larvæ obtained from Valencia tomatoes in June, 1893; in 1896 he received about twenty full-grown larvæ in June, and one on Sept. 24th, the latter imported from Lisbon, but the others from Spain. Probably the majority of the specimens of the species captured in this country arrive here in the larval state, but it is quite possible that occasionally the insect may pass through the whole of its metamorphoses on British soil. Mr. Golding Bird states (Entom. ix. 261) that in the autumn of 1876 he found some larvæ on the flower-heads of scarlet geranium in the Isle of Wight. They were very numerous, and varied greatly in colour, but as he did not know to what species they belonged, and thinking that they would produce some common moth, he only secured about half a dozen. These were injured in the journey to London, and he reared but one imago on August 1st.

In the United States, where it is known as "Cotton-boll worm," "Corn-ear worm," and "Tomato-fruit worm," *H. armigera* has the reputation of being destructive to the cotton crop, the estimated damage ranging in the different States from two to something like fifteen per cent. Probably, however, it is more injurious to corn, as there are five generations in the year, and the first three of these occur in cornfields more especially. Besides corn, cotton, and tomato, the larva affects beans, tobacco, pumpkins, melons, garden flowering plants, and also various wild plants. The species has been the object of special investigation by

entomologists appointed for the purpose, and several bulletins dealing with the matter have been issued by the U. S. Department of Agriculture, Division of Entomology.—RICHARD SOUTH.

EPIONE PARALLELARIA IN SCOTLAND.—In a collection of Lepidoptera made by Mr. W. Salvage in Sutherlandshire, in 1892, was a fairly long series of *Epione parallelaria* (*vespertina*); referring to which he says, to use his own words, "I not only captured *vespertina*, but bred it from larvæ found on aspen and sallow at Invershin, Sutherlandshire; I also took the moth in North Ross. The species is pretty well distributed in Sutherlandshire, and occurs from sea-level to about a thousand feet on the mountains. Aspen is, I believe, a new food-plant." The specimens appear to be somewhat brighter in coloration than the York examples; this apparent difference may, however, result rather from the particular individuals compared, than from any general tendency to local variation. These records, taken in conjunction with the recent captures reported from Roxburghshire, suggest the probability of a distribution over a very considerable portion of Scotland.—ROBERT ADKIN; Lewisham, Dec. 11th, 1897.

VENILIA MACULARIA IN SCOTLAND.—In the same collection there was also a long series of *Venilia macularia*, sufficiently long indeed to suggest that the species had been met with in some abundance. In several of the individuals comprised in it, the black blotches are larger than is usual in the South English examples.—ROBERT ADKIN.

CONCERNING VARIETIES OF EPINEPHELE IANIRA, L.—Hofmann in his book, 'Gross-schmetterlinge Europas,' makes no mention of under-side variation in *E. ianira*, although he describes corresponding varieties of *E. hyperanthes*. The recognized named forms of *ianira* given in Staudinger's list No. 40 are var. *hispulla*, var. *fortunata*, var. *telmessia*, and var. *kurdistanica*. In considering specimens of *ianira* from the same neighbourhood, it is found that they differ from one another in the number and position of the spots on the under side of the hind wings, some males having two, three, four, five, and even six spots, while occasionally one finds an individual with these spots entirely absent. The following table shows the proportion of each form in sixty-four male specimens taken near Sofia during June and July, 1896:—

Number of spots on the under side of hind wings	0	1	2	3	4	5	6
Number of specimens ...	1	0	36	19	6	1	1

Thus it is seen that more than half of these male *ianira* from Sofia have only two spots on the hind wings; one-third possess three spots, and one-tenth four; the other forms are rare, while none have yet been taken with one spot only. The example without the white dots on the hind wing had the ocellus of the fore wing reduced to a mere point. In the case of the female the number of spots appears to range from one to three, while a much larger proportion, *viz.* fifteen out of twenty-six, have no white ocelli in the hind wings. The colouring of the ninety specimens examined exhibited every gradation, from typical *E. ianira* to var. *hispulla*.—PROF. P. BACHMETJEW in 'Societas Entomologica,' xii. 8.—(W. M.)

A GYNANDROMORPHOUS *PLATISAMIA CECROPIA*.—Mr. Carl Frings ('Societas Entomologica,' xii. 1) records the capture of a gynandrous specimen of *P. cecropia* in the spring of 1896. The insect is completely divided by a line passing down the centre of the body into male and female, but it is interesting to note that the genitalia are typically male.—(W. M.)

CAPTURES AND FIELD REPORTS.

PLUSIA MONETA.—Mr. Charles E. Morris, of Vernon Lodge, Preston, near Brighton, informs me, in a letter dated the 12th inst., that he and Mr. Tucker captured eleven specimens of *Plusia moneta* on *Delphinium* in their garden at Preston in July last. He adds that they also found two pupæ of the species.—H. GOSS; The Avenue, Surbiton Hill, December 16th, 1897.

NOCTUA DAHLII AND *TRIPHENA ORBONA* = *SUBSEQUA* IN SOUTH OXFORDSHIRE.—Though belated, it may be interesting to record the capture of *Noctua dahlia* on August 1st, 1896; and one specimen of *Triphæna orbona* = *subsequa* on July 30th, and another by Mr. Hamm on August 2nd, 1896. These species have not hitherto, I believe, been recorded from the Reading district.—J. CLARKE; Reading, Dec. 13th, 1897.

HELIOTHIS ARMIGERA IN 1897.—On 21st October last I captured a specimen of this moth at ivy bloom in this neighbourhood.—A. DRUIT; Christchurch.

NOTES FROM NORTH WALES, 1897.—In January *Phigalia pedaria* and *Hybernia rupicaprararia* were abundant at light. A month later *H. marginaria* occurred freely; but *Anisopteryx æscularia* and *H. leucophaæaria* were each represented by a single specimen. The latter seems to be scarce in our neighbourhood. In March *Tæniocampa stabilis*, *T. incerta*, *T. gothica*, and *T. pulverulenta* were common at willows; while *T. munda* occurred in abundant variety. I noticed that it was the first of its genus to appear commonly. Of *Xylocampa areola* I boxed a good series off palings. Butterflies were later here than in 1896. The first specimens I saw of *Euchloë cardamines* (May 9th) were very small males, averaging about 1½ in. in expanse. The ova and larvæ of this insect were to be found very freely during June and July on *Cardamine pratensis* and *Alliaria officinalis*. Two specimens of *Gonepteryx rhamni* were seen on June 5th; the first I have noticed in this district. *Argynnis euphrosyne* is one of our commonest butterflies; it is found nearly everywhere in the valleys or low wooded hills of the county. For *Melitæa artemis* I have discovered two localities, where it occurs very sparingly, and of the ordinary type. The common Pierids were much scarcer than usual. *Argynnis aglaia* is another generally distributed butterfly here, but I have not found it abundant at any time. *Satyrus egeria* I have never seen here; *S. megæra* is very scarce. Of the blues I have taken only *Lycæna icarus* (common) and *L. argiolus*, which I have found in several directions. *Vanessa c-album* I saw but once, May 9th; *V. io* was considerably in evidence during May and June.

Turning to the Heterocera again, in May I got a pair of *Smerinthus ocellatus* in my garden. Later in the month I took seven specimens of

Macroglossa fuciformis (the narrow-bordered bee-hawk) over flowers of *Orobis tuberosus*, and saw others. *Numeria pulveraria* occurred frequently; but other Geometers, abundant last year, were very scarce this: among these were *Odontopera bidentata* and *Anaitis plagiata*. In June *Grammesia trigrammica* was very abundant at light, along with *Hadena dentina* and *Leucania comma*; and a few *Cilia spinula*. I took three *Agrotis cinerea* again at light, all males and all rather worn; they occurred on May 31st and June 4th.

On Whit-Monday we found *Ematurga atomaria* and *Melanippe tristata* swarming on the Clôg, a hill some five miles off. From the middle to the end of June moths swarmed at sugar. On June 30th I counted over two hundred Noctuæ on one patch about three feet long by eighteen inches broad. *G. trigrammica* and *Agrotis exclamationis* were very abundant during the first part of that period. Of the latter I took one fine variety similar to the lower figure in Newman's 'British Moths.' As the month advanced *Agrotis segetum*, *Xylophasia monoglyphæ*, *X. lithoxylea*, and *Triphana pronuba* grew commoner. Among other moths that occurred less freely were *Miana strigilis* (in great variety), *Rusina tenebrosa*, *Acronycta psi*, *A. rumicis*, *Chariclea umbra* (one only), *Aplecta nebulosa*, *Noctua festiva*, *N. triangulum*, *N. augur*, *Mamestra anceps*, and *Apamea basilinea*. On June 29th I missed a fine specimen of *Cymatophora octogesima* at sugar. On June 20th I found a number of larvæ of *Liparis (Porthesia) chrysorrhæa*, which produced a fine series of "brown-tails" in July.

Two days in mid-June we spent at Dinas Mawddwy. *Bupalus piniaria* swarmed in the pine woods there, along with *Macaria liturata*, *Larentia pectinitaria*, and *Tera obeliscata*. At rhododendron bloom we took a series of *M. stellatarum*; while every flower seemed to harbour two or three specimens of *Eupithecia pulchellata*.

Cucullia umbratica was common at light throughout June. *Atrata charophyllata* I have found in most of our hill country. During July we netted *Pseudoterpnæ cytisaria* and *Metrocampe margaritaria*, *Cidaria pyraliata*, *C. fulvata*, *Crocallis elinguaris*, and lots of the commoner species of *Melanippe*.

August and part of September I spent in Somersetshire. Since returning here insects have been very scarce. I never remember so barren an autumn. We had during September and October a long spell of dry weather, with a succession of northerly and easterly winds. Add to this the fact that ivy is scarce in our neighbourhood, and such unusual absence of even common moths can be explained to a certain extent.

I took but two specimens of *Anchocelis pistacina*, and one of *Miselia oxyacanthæ*; last year they were very abundant at light. *Cheimatobia brumata* completes my record; it is still most consistent in its plentiful appearance.—ALFRED S. TETLEY; Llwynon, Newtown, N. Wales.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—December 1st, 1897.—Mr. R. Trimen, F.R.S., President, in the chair. Mr. Hope Alderson, of Hilda Vale, Farnborough; Mr. Arthur Horne, of Ugie Bank, Aberdeen;

Mr. Charles H. Pemberton, of 4, Kent's Terrace, Torquay; and Mr. E. P. Stebbing, Indian Forest Service, were elected Fellows of the Society. Mr. Dudley Wright exhibited an aberration of *Argynnis euphrosyne*, in which the upper side was suffused with black, and the silver spots of the under side of the hind wing converted into streaks. On behalf of Mr. W. H. Tuck, Mr. Tutt showed examples of *Metæcus paradoxus*, L., taken in nests of *Vespa vulgaris* near Bury St. Edmund's, together with some of the cells in which they were found. About a fifth of the nests examined were affected, some containing as many as twenty-four, twelve, and eight examples of the beetle; the more usual number present was from two to four. The dates between which examples were taken in 1897 were from Aug. 2nd to Oct. 1st. According to Dr. Chapman, the eggs were laid in the cracks of posts, &c., from which the wasps got the pulp to make their cells. Combs were also exhibited from nests of *Vespa crabro* and *Vespa germanica*, in which Mr. Tuck had found larvæ of *Velleius dilatatus*, Fabr., which, however, he had been unable to rear. The Rev. A. E. Eaton exhibited a specimen of the singular *Myodites subdipterus*, Fabr., taken by himself at Biskra, Algeria, and a near ally of *Metæcus*. Mr. Blandford called attention to a new instance of the destructive propensities of *Dermestes vulpinus*, Fabr. He had received examples found at Hong-Kong among flags made of bunting, which were presumably injured, although no details had been forwarded. This form of injury was analogous with the damage to woodwork recorded by himself and others; it had nothing to do with the feeding-habits of the insect, but was committed by the larvæ in their search for shelter in which to pupate. Probably the flags had been stored at some period in the neighbourhood of infested leather goods, or dried provisions. The only other case of damage to textile fabrics by *Dermestes vulpinus* which he knew of occurred in connection with the case recorded by him (Proc. Ent. Soc. Lond. 1890, p. xxxi); a blue handkerchief spotted with white, left in the infested building, was found next day to have all the white spots eaten out. In the ensuing discussion Mr. C. G. Barrett referred to the damage done by Agrotid larvæ to linen spread out to bleach on the hillsides near Belfast. Investigation showed that this did not take place except when the linen was gathered up and brought into the warehouses without being shaken. The caterpillars which had taken shelter underneath it then ate their way through it, in order to escape in search of food. Mr. Champion communicated papers entitled "Notes on American and other Tingitidæ, with Descriptions of two new Genera and Four Species"; and "A List of the Staphylinidæ collected by Mr. J. J. Walker, R.N., in the Straits Gibraltar."—W. F. H. BLANDFORD, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—November 25th, 1897.—Mr. R. Adkin, F.E.S. President, in the chair. Mr. Tunaley exhibited xanthic specimens of *Epinephela ianira*, taken in North Kent in 1896; a variable series of *Angerona prunaria*, from the same locality; and, on behalf of Miss Miller, of Chelmsford, an unusual variation of *Acronycta rumicis*, having a distinct red tinge on the submarginal area of the wings, some portions of the body being *similarly tinted*. Mr. H. Moore, a small collection of Lepidoptera, taken in France last August, while on a cycling tour, and contributed notes.

E. ianira, generally, and *Erebia æthiops* and *E. neoridas*, locally, were the only species seen at all commonly. Chambéry was the farthest point reached. Mr. Bristowe, a small collection of Lepidoptera taken during a short visit to Japan. It was remarked how close many of the species were to those of our own country, but much larger. Mr. Tutt, a bred series of *Cnethocampa pityocampa* from larvæ taken by Dr. Chapman in the South of France, and remarked on the considerable sexual dimorphism; also a specimen of *Eriogaster catax*, from the same locality. Mr. Adkin, an asymmetrical specimen of *Arctia caia*, in which the left fore and hind wings were much suffused with the dark brown colour, the right wings being normal. The specimen was one of a second brood, and emerged from pupa in October last.

December 9th.—The President in the chair. Col. Partridge exhibited specimens of *Ephyra trilinearia*: (1) female parent, typical; (2) specimen of brood from above, dwarfed, very red, and annulated; (3) specimens of same brood which stood over in pupal stage. The last were not so red, nor dwarfed, and the annulated spots could only just be traced. Mr. McArthur, a box of varieties captured or bred this year, including *Arctia caia*, yellow; *Abraxas grossulariata*, radiated and coalescent; *Bombyx rubi*, with the transverse lines lighter and wider than usual, and others. Mr. Mera, a box of *Abraxas grossulariata*, bred at Forest Gate in 1897, separable into two distinct groups, a light and a dark one. Mr. Montgomery, specimens of *Smerinthus ocellatus* and *Cossus ligniperda*, which had been extremely affected by grease, and which were admirably cleansed, even to the fringe of the abdomen, by the use of benzine collas and a blowpipe. Mr. Clark, a photo-micrograph of a mite which, with numerous others, he had found on a humble-bee. Mr. Adkin, series of *Epione parallelaria* (*vespertina*) from Sutherland, and specimens of *Abraxas grossulariata*; in the latter the usual yellow markings were of a dull ochreous; they were bred by Rev. Joseph Greene, of Clifton. Rev. Joseph Green sent drawings of some seventy varieties of *Abraxas grossulariata*, bred during the last six years near Bristol, and communicated notes on the same. Mr. Turner, eight species of the genus *Libythea*, and read notes on their relationships, characteristics, and distribution. It was announced that Part I. of the Proceedings was published, and ready for distribution.—HY. J. TURNER, *Hon. Report. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—November 15th. Mr. G. T. Bethune-Baker, President, in the chair. Mr. R. C. Bradley, *à propos* of Mr. Kendrick's paper on mimicry, read at the last meeting, exhibited a few examples of mimicry amongst Diptera: *Volucella bombylans* in both its forms, with *Bombus lapidarius* and *B. terrestris*, and *V. inanis*, with its host *Vespa crabro*. Mr. C. J. Wainwright also exhibited a number of examples of mimicry among Diptera, arranged in groups, showing a number of species mimicking *Apis mellifica*, another lot showing a general wasp-like type, and another lot closely resembling *Bombus muscorum*, &c. Mr. A. H. Martineau showed a similar lot of examples: *Chilosia flavicornis*, with an *Andrena* with which it flies in the spring, when few other large insects are about, and which it very closely resembles; *Arctophila muscitans* and *Criorrhina oxyacanthæ*, both of which, the former especially, so closely resemble *Bombus muscorum*, that they are frequently taken for bees, and the real

species not discovered till it is in the net; *Merodon equestris*, which not only resembles *Anthophora furcata*, but flies in exactly the same manner, and has a similar characteristic, a high-pitched note. He also showed the species of *Psithyrus*, with their hosts *Bombus lapidarius* and *B. terrestris* (female), which they resemble very closely, undoubtedly for protective purposes, and probably to enable them to enter the nests of their hosts unobserved, as their entrance is frequently disputed when detected. Mr. G. T. Bethune-Baker showed a species of *Arhopala* mimicking *Danis appolonius*, a widely different Lycenid.—COLBRAN J. WAINWRIGHT, Hon. Sec.

RECENT LITERATURE.

The Lepidoptera of the British Islands. By CHARLES G. BARRETT, F.E.S. Vol. iv., pp. 404. London: L. Reeve & Co. 1897.

IN the present volume we have a further instalment of the Noctuina, in which ninety-eight species, comprised in thirty genera, are considered.

It is satisfactory to note that Mr. Barrett has not found it desirable to make any very striking changes in the arrangement or generic nomenclature of this family. He has, however, adopted *Eurois* for *occulta*, *prasina* (*herbida*), *adusta*, and *porphyrea* (*satura*). The first-named is the type of *Eurois*, Hübn., and *prasina* appears to be congeneric with it, but it is probably not quite correct to include *adusta* and *porphyrea* in this genus. *Popularis* is usually assigned to *Neuronia*, Hübn., but our author places this species, together with *cespitis*, in *Heliophobus*, and removes *hispidus* to *Ulochlœna*. *Abjecta*, *sordida* (*anceps*), and *furva* are referred to *Hama*, and there seems to be no objection to this; but it is curious to note that Mr. Meyrick includes all three of these species in *Hadena*. Sir George Hampson (*Fauna Brit. Ind. Moths*, ii. p. 198) merges *Mamestra*, Ochs., and *Neuria*, Guen., in *Hadena*, Schrank, established in 1802 (*Fauna*, Boica, ii. 2, p. 158), and gives *cucubali*, Schiff. [Fues.] as the type. Mr. Barrett retains *cucubali* in *Dianthœcia*, and Mr. Meyrick includes it in *Harmodia*, Hübn. (= *Dianthœcia*, Auct.). *Aprilina* is placed in *Chariptera*, Guen., and this would seem to indicate that it is considered congeneric with *culta*, Fabr., the type of the genus. *Dryobota* adopted for *protea* appears to be a more suitable genus for the species than either *Polia*, to which it is referred by Mr. Meyrick, or *Hadena*, in which it is included by several authors; probably, however, its really correct position would be in *Eurois*.

At the present time both classification and nomenclature are in a state of transition, and it will probably be many years hence ere anything approaching finality in these matters is attained. In the meantime the student must be prepared to find in future works on British Lepidoptera many more indications of the changes in progress than those we have referred to as occurring in the volume under notice. We do not say this in disparagement of Mr. Barrett's work; on the contrary, we consider that he has done wisely in keeping closely to the old track.

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ARGYNNIS PAPHIA VAR. *VALESINA* AB.



I AM obliged to Mr. Sabine, of Erith, for the loan of the highly interesting aberration of the *valesina* form of *A. paphia* figured above. The specimen, which was taken in the New Forest last year, was purchased at Stevens's auction rooms last December.

Although described in the catalogue as a male, the insect is certainly a female *valesina*, and the ground colour is that proper to the form, but rather deeper in tint than usual, and much suffused with black. The aberrant character of the markings is well shown in the figure.

I may mention that Mr. Leech has a very similar example in his collection. This specimen was received, among others of the normal *valesina* form, from Chang-Yang in Central China.

In the 'Entomologist's Monthly Magazine' for January there is a figure of an almost parallel aberration of *A. paphia*, which is also a female, and was captured in Northampton last July by Mr. Kenneth J. Morton. A male specimen of the same form, taken by Mr. W. J. Argent in the New Forest in July, 1881, is figured in the 'Entomologist,' xv. pl. 1, fig. 4; and in an article on "Aberrations in the genus *Argynnis*," in the same volume, the late Mr. J. Jenner Weir, referring to this example, states that "another similarly but not so strongly marked" was obtained at the same time and place.

RICHARD SOUTH.

*TEPHROSIA CREPUSCULARIA (BISTORTATA) = T.
BIUNDULARIA.*

By J. ARKLE.

LAST season I devoted a large amount of time and attention to the *Tephrosia* question, and as my experience contributed in a great measure to the opinion I now hold that *T. crepuscularia* (*bistortata*) and *T. biundularia* are one and the same species, I venture to think that what I have to say upon the subject may be of interest to the readers of the 'Entomologist.' First, let it be assumed, but only for the sake of clearness, that *T. crepuscularia* (*bistortata*) is the double- or even treble-brooded insect, and that *T. biundularia* has only one brood of imagines in the season.

I had a regular farm of *Tephrosias*—hundreds of eggs, hundreds of larvæ, and many imagines—from Perthshire, Cheshire, Derbyshire, Yorks, Berks, Essex, Somersetshire, Devonshire, Hants, and Sussex. These kept me in such constant watchfulness, that at no time was I able to leave home for more than a couple of days in succession. Besides all this I had a correspondence which may justly be described as voluminous. On all these heads my thanks are due to those who so kindly helped me, and, in addition, my apologies whenever I appeared in the part of the importunate.

Much has been said of the egg, and I therefore brought all my powers to bear on this initial stage of the insect. I may say, at this point, that my observations throughout were simplified by the use of a powerful lens and an excellent binocular microscope. Neither in size, shape, or colour could I distinguish between the egg of *T. crepuscularia* (*bistortata*) and *T. biundularia*. That marvellous faculty of variation, which is such a character of the insect in all its stages except that of the chrysalis, was almost as much in evidence in the egg as in either larva or imago. Sometimes one, sometimes the other, had the advantage in size, greenness, or as regular or irregular ovals or, if you like, cylinders with rounded ends. Fourteen laid by a Delamere Forest female were the palest. Quoting from my note book, I find them described (May 10th) as "pale, dull straw-colour, very nearly that of the chip box on which they were laid. Their shells have a very faint iridescent green, only visible under a strong lens." As a rule the eggs were enveloped in a whitish "fluff" or down, but even this feature was inconstant. It was Dr. Riding who discovered this "silk" to be "contained in a pouch at the extremity of the abdomen, in the form of dense bundles about 2 mm. long, and resembling, in miniature, locks of wavy flaxen hair. Hitherto all such coverings were supposed to consist of scales from the anal segment" (*Entom. Record*, ix. 130).

It is in the larva state where variation is most conspicuous, but always in the matter of colour. The constant characters are (1st), *structural*, as a general snakelike appearance increased by lateral swellings of segments 3 and 4, particularly segment 3; slightly raised and notched appearance, dorsally, of segments 3 and 12, the notches being raised tubercles, each emitting a short hair. (2nd), *constant colour markings*, as a pale blotch, whitish, yellowish, or reddish above and upon the claspers of segment 10; and black, oblique, dorsal marks on segment 12, almost forming a V, pointing anally and terminating in the notches. *Constant colour markings up to the final stage* are segments 6, 7, 8, darker, dorsally, than the rest, and a V-shaped black mark on segment 6 similar to that on segment 12, but pointing towards the head. The V-shaped mark was most constant, even including the final stage, in New Forest larvæ (*crepuscularia* = *bistortata*). In other matters of coloration, as the stripes, or traces of them, there was constancy enough; all else was chaos, from light hazel with darker shades, to dark reddish brown with darker blotches. Thus the dark or oblique marks on segment 12, ending in the notches or tubercles, are really the anal terminations of the sub-dorsal dark stripes, and the pale marks above and on the claspers of segment 10 are really the terminations of the broad, yellowish (but blotched with reddish, &c., and so interrupted) mid-side stripe. Of course there is always the faint dorsal stripe, which is usually lost in the dark dorsal areas of segments 6, 7, 8, and sometimes 9. (See Entom. xxx. 140). The palest larvæ, taking them as a whole, were the Somerset *crepuscularia* (*bistortata*); the darkest, those of Delamere Forest (*biundularia*). A scarce form of the latter is as black as ink, except in the ever-present pale (in this case whitish) blotch above and upon the claspers of segment 10. I put six of these in a pot by themselves, to see if the resultant moths turn out to be the black variety taken by Mr. Hargreaves in March, 1896 (Entom. xxix. 216; xxx. 142). If so, I hope to propagate the breed.

Some time ago I was showing my collection to a veteran entomologist who, I know, will read these remarks. We came to these Tephrosias, and he asked, "Do you believe they are distinct species?" "Of course," said I; "don't So-and-so, and So-and-so, and So-and-So believe it!" "Well, then," he asked, "what are the points of difference?" Whereupon I ran out a formula, which I will not quote, as I now believe there was nothing in it. It was a formula inherited, but, among the many things entomological, never examined. Never shall I forget the veteran as he politely observed, "I am sure I ought to be obliged for all this information!" So I determined to make up my own mind upon the *Tephrosia* question, and I have done so. Whether the moths be ochreous, black, or "bone-white" in general colour, whether they be faintly marked or banded, to

me they will be henceforth *T. crepuscularia*. Other opinions shall have my respect, as in duty bound,—“I bend my back and bow my head,” as they sing in ‘Dorothy.’

I will not weary the reader, or trespass upon the indulgence of our editor, by appending a copy of a table which lies before me, showing dates of hatching, pupation, or emergence of the various *Tephrosias* committed to my charge. I will rather summarise, and the general conclusion I arrive at is this: if these *Tephrosias* appear early enough to lay eggs which hatch in March, April, or even as late as the first few days of May, the climatic conditions, local environment, and acquired habit may permit a second, third, and, I should not be surprised, a fourth brood of imagines. On the other hand, if they appear so late that the eggs do not hatch before the end of May or beginning of June, there will, as a rule, be only one brood. A second emergence of *York biundularia* was represented by a male of “bone-white” ground colour on Sept. 8th, while those of Delamere Forest showed a male of the local type on Aug. 19th, and a female at the end of November, the larvæ being reared and the pupæ kept behind a high wall facing north, in the open. And who shall say that the six moths I took, June 13th, 1891, in Delamere Forest, were not representatives of a second brood! They were fresh insects, and I obtained eggs from them (Entom. xxiv. 287). Surely here is evidence of a common trait or character! Anyhow, no one would think of separating moths into species because *here* there is only one brood in the season, and *there* two; if so then the *Plusia festucae* of Bolton (Entom. xxix. 113) is a different species to the *Plusia festucae* of Chester. Again, second and third brood imagines (bred) of *crepuscularia* (*bistortata*) were fewer at Chester than, for example, in Somerset and Hants; that is, as they became exposed to colder conditions and less favourable environment. Somerset gave me, without extenuating circumstances, a second brood of five moths from three dozen larvæ; Hants, a third brood of nine from one hundred and forty-four larvæ; the rest of the pupæ are, in each case, lying over the winter. It was in this attempt to arrive at general conclusions that I met my greatest difficulty. I could not fit a communication from a valued correspondent into the chain of evidence. At last, on comparing the date with the postmarks, I found him, accidentally of course, two months out!

The concluding part of my inquiry into the two *Tephrosias* deals with matters entirely microscopic. It is without weight either for or against identity; the value of x equals nothing! But, to naturalists, anything under the microscope is so enchanting that “we lose and forget the creeping hours of time.” Such must be the excuse for presenting my experience to the reader. Dr. Beale, in his ‘How to work with the Microscope,’ p. 29, says:—“The best light during the day is to be obtained from a

white cloud upon which the sun is shining." And, again, "Direct sunlight is not to be employed, and a very strong light of any kind is hurtful to the eyes." Under this advice I set to work on a brilliant July day, my sitting lasting six hours, to see if there could be any difference between the wing-scales of *crepuscularia* (*bistortata*) and *biundularia*. The lenses used were chiefly $\frac{1}{2}$ in. for individual examination, and $1\frac{1}{2}$ in. for viewing "the field." And how can we best examine, microscopically, the scales of an insect? Take a glass slip, 3 in. by 1 in.; breathe upon it, and press gently but firmly an upper and lower wing of the set specimen on the part of the slip breathed upon; lift the wings (the moth is as good as ever) and you will just see a little patch of dust on the slip. This is a facsimile of the wings, consisting of scores upon scores of scales. Place the slip on the stage of the microscope, and adjust the instrument to suit your sight. Then take pencil and paper and *sketch what you see*, for memory cannot be trusted in these matters. Never did transformation scene equal the sight you behold! In the sun—for we will do the thing we ought not to do—and with a $1\frac{1}{2}$ in. lens, the scales glisten like burnished silver. We are looking at "a field" of them. They are all perfectly distinct in outline, but the sight is too much for mortal eye, so we choose the light from "a white cloud," and the silver becomes mother-of-pearl, with all sorts of prismatic colours. Still deeper we go with the $\frac{1}{2}$ in. lens, and the scales are seen to have a central vein or nervule, with close, parallel, but dotted lines throughout their entire length. With this lens I made out the dots to be little depressions with raised centres—but here I speak from memory.

The shape of the predominant wing-scales* on *crepuscularia* (*bistortata*) and *biundularia* is exactly like that of the blade of a scull broken off near the top of the shaft. The end, or termination, however, is prominently toothed. These teeth may be two in number—in which case they are of equal length—three, four, or five, and then the central one, two, or three of them are longer than the others. A rarer form is the well-known "battle-dore" scale, and a still rarer one has the outline club-shaped. The longer fringe-scales (cilia) are, perhaps, the most beautiful of all. Some are shaped like a blade of grass, but the majority are deeply serrated or toothed at the extremities—a sketch before me shows four, another six, serrations—in fact, the cilia are perfect miniatures of the petals of a pink. The discovery of a fresh scale, of course, meant testing the whole of the specimens over again until it was found in all. This multiplied my labours, which did not end until the 30th of October.

Summarising, then, I found all the Tephrosias, including *consonaria*, *luridata* (*extersaria*), and *punctulata*, had scales of the

* Their length = breadth \times 3.

same pattern. In *T. punctulata* I came across one with seven notches or serrations; another with nine. But I must confess I was hardly prepared to find that *the wing-scales of all moths*, as far as I could see, were of similar design. But so it is, and I append a list of additional species I examined:—*Boarmia consortaria*, *Uropteryx sambucaria*, *Angerona prunaria*, *Phigalia pedaria* (*pilosaria*), *Hemithea strigata* (*thymiaria*), *Acidalia aver-sata*, *Halia vauaria* (*wavaria*), *Ematurga atomaria*, *Abrazas grossulariata*, *Hybernia marginaria* (*progemmaria*), *Anisopteryx æscularia*, *Anaitis plagiata*, *Tanagra atrata* (*chærophyllata*), *Melanippe montanata*, *Coremia unidentaria*, *Cidaria corylata*, *Pyralis farinalis*, *Eurrhynx urticata* (*urticalis*), and *Heliothis armigera*.

Chester: Jan. 7th, 1898.

"DEILEPHILA GALII OF 1897."

BY THE REV. A. MILES MOSS.

To those who were interested in the article on the re-appearance of *Deilephila galii* (Entom. xxx. 290) on the Lancashire and Cheshire coast, I have thought that it may be of further interest to state final results. I therefore briefly append the sequel.

Though too late on the scenes, it will be remembered that I was fortunate in procuring four larvæ. One of these I preserved, the remainder pupating more or less satisfactorily. I say *more or less* because the specimen given to me by the greenkeeper at Wallasey, owing, as I take it, to the rather rough handling which it received just at the critical period, became slightly malformed in the pupa, having a deep indentation between head and thorax. One of the remaining two, found at Waterloo, in pupating failed to lay its right antenna case in its appointed socket, this remaining in a curved position over the leg cases.

These three pupæ, together with six pupæ of *Chærocampa porcellus* and one *Macroglossa stellatarum*, I placed in a flower-pot filled with sand and gravel, and kept moist continually by a saucer of water, and the pupæ were all placed in a vertical position in holes in the sand, the heads only appearing. The pot was covered with a piece of muslin, and left on the kitchen range, in which position it sometimes attained an almost frightening temperature, the thermometer varying from about 50° F. (*i.e.* at night) to between 115° and 120° when the fire was hot, and I feared that my poor *galii* would be cooked alive! Past experience, however, in forcing other pupæ has convinced me that they can stand an almost incredible amount of heat so long as it be accompanied with moisture.

This forcing operation began on Oct. 20th. By Nov. 12th I

could see that the malformed specimen was forming, and on Nov. 15th it endeavoured to emerge, but, though the notch behind the head did not seem to hinder the process of transformation, yet the insect became a cripple from another cause, the spiracle tissues apparently being too strong to release the abdomen from its case. Perhaps this was due to excess of moisture, or to a too quick development.

From some other unknown cause the well-formed pupa died about Nov. 30th, and I feared that my success with *galii* was to be limited to a slight increase of experience, not the most happy.

However, on Dec. 6th a specimen of *C. porcellus* emerged satisfactorily, and to my great joy the third and last *galii* also emerged satisfactorily on Dec. 19th, a perfect, though not very large, male; the slight malformation of the antenna case apparently having no detrimental effect to its contents.

All my *M. stellatarum* have already emerged without forcing, with the exception of the one experimented upon, which succumbed under the unwonted treatment of heat and moisture.

It will thus be seen that all have been subjected to the same conditions with varying results of failure and success, and I should much like to know why it is that one month's forcing should affect one insect, while another should require twice that period; why, under the circumstances, one should live and another die. Truly nature's ways, though full of interest, are past finding out.

Since writing the above, another perfect specimen of *C. porcellus* has emerged,—January 14th,—having required nearly three months of this irregular system of forcing to complete its transformation.

107, Camden Street, Birkenhead : Dec. 22nd, 1897.

SYNOPSIS OF THE NORTH AMERICAN BEES OF THE GENUS *NOMIA*.

By T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

MR. WILLIAM J. FOX in 1893 ('Ent. News,' p. 134) gave a synopsis of the North American species of *Nomia*, including, however, only four species. One of these he described as new under the name *N. punctata*, but this name being preoccupied in the genus, Dalla Torre altered it to *N. foxii*. In the present synopsis ten species are included. One other species is known from the western hemisphere—*N. tarsalis*, Westw., from Brazil. The species of *Eunomia*, Cr. (not *Eunomia*, DC., a genus of Cruciferae), viz. *E. apache*, Cr., *E. marginipennis*, Cr., and *E. heteropoda*, Say, are excluded.

NOMIA, Latr.

- Purple-blue, head and thorax with fulvous hair.
(Mexico) *caelestina*, Westw.
- Apical margins of abdominal segments greenish or
greenish white 1.
- Abdomen ferruginous, or ferruginous and black,
apical margins not greenish *nevadensis*, Cress.
- Abdomen black, apical margins not greenish 4.
1. Size large, 17 mm. or over; apex of hind tibiae
of male not emarginate *nortoni*, Cress.
- Size medium, less than 15 mm. in length 2.
2. "Dorsal abdominal segments of female sub-
opaque, not punctate, but feebly roughened
or granulated; apex of hind femora of male
widely emarginate."—Fox, *l. c.* (Cuba) *robinsoni*, Cress.
- Dorsal abdominal segments distinctly punctured 3.
3. "Clypeus smooth." (Eleuthera, Bahamas) *wickhamii*, Ashm.
- Clypeus well punctured *foxii*, Dalla Torre.
4. Pubescence sooty-black, abdomen shining. (Brazil,
Mexico) *kirbii*, Westw., MS., Smith.
- Pubescence pale 5.
5. Tibiæ of male ferruginous, tegulæ amber-colour *bakeri*, n. sp.
- Tibiæ of male black 6.
6. Tarsi of male reddish testaceous. (Canada) *compacta*, Prov.
- Tarsi of male black *persimilis*, Ckll., ined.

Nomia foxii, D. T.

Fox records this from Colorado, New Mexico, and S. Dakota. Specimens are before me which were collected by Prof. C. H. T. Townsend at Turkey Tanks, Arizona, July 17th and 18th. The male, not known to Fox, differs little from Ashmead's description of *wickhamii*. The hind femora are thickened; the hind tibiae triangular, greatly enlarged distally, testaceous, with a black blotch on each face, and the outer apical corner black; the hind tarsi with the basal joint testaceous and flattened. Flagellum ferruginous beneath.

Nomia bakeri, n. sp.

♂. Length not quite 10 mm., black, strongly and closely punctured; pubescence short, dull white, tolerably dense on face, pleura, and post-scutellum, forming narrow bands on the apical margins of the abdominal segments. Flagellum with a dark ferruginous tinge beneath. Wings dusky yellowish, apical margin broadly smoky; stigma ferruginous, nervures dark brown; tegulæ transparent amber-colour; femora black, anterior femur with a ferruginous stripe in front, hind femora incrassate, the basal half dark ferruginous; tibiae ferruginous, hind tibiae broadened to apex, but not so much modified as in *N. foxii*; tarsi ferruginous, hind tarsi mostly black except at base. The face is broader below than in *N. foxii*, and the punctures of the

first two abdominal segments are very different, being small and clear; these segments have conspicuous transverse depressions.

Hab. Colorado (C. F. Baker, 1591). Taken at flowers of *Solidago canadensis*, at Fort Collins, Aug. 8th, 1895.

Nomia persimilis, Ckll., ined.

The female occurs at Albuquerque, N. M., in company with *Andrena helianthi*, to which it has a remarkable superficial resemblance. The male is larger than *bakeri* (about 13 mm. long), and has black legs and light testaceous tegulæ. The punctuation of the male abdomen is small and close as in *bakeri*, but the hair-bands are thin and weak, scarcely deserving the name of bands. Flagellum black; face quite broad. Also found at Lincoln, Nebraska (L. Bruner), and in the Mesilla Valley of New Mexico. The female visits the sunflower in September.

P.S., Dec. 31st.—I have just received from M. J. Vachal an interesting paper on the genus *Nomia*. He describes *M. triangulifera* from a single male taken in Kansas: this new species is evidently very close to my *N. persimilis*, and may even be identical with it. He also re-describes *N. cressoni*, Westw., 1875; and it certainly seems probable that the name—generally regarded as a synonym of *nortoni*—belongs to a distinct species inhabiting Mexico.—T. D. A. COCKERELL.

Mesilla, New Mexico, U.S.A.: Dec. 24th, 1897.

DRAGONFLIES IN 1897.

By J. ARKLE.

I HAD intended continuing my season's experience among the dragonflies upon the lines of my previous notes (Entom. xxx. 250). However, the capital paper by Mr. Lucas, *l. c.*, p. 277, together with the admirable illustrations, tempts me to consider the subject of greater importance, and to treat it separately.

By woody brooks in "the flowery month of June" *Calopteryx virgo* may frequently be met. It is by no means common about Chester, but I saw half-a-dozen on the wing in June and July. A couple of these were sporting over some rushes on the margin of the Dee near Eaton Hall. Worthenbury, however, some twelve miles higher up, is the great home in the district for this handsome dragonfly. There it may be seen in scores.

Wanting a series of *Pyrrhosoma minium* for a correspondent, I made a couple of close searches in the two haunts known to me in Delamere Forest about the end of June, but at neither place was it in evidence! The fact was, the character of both

localities had changed during the last few years. They were drier,—the Scotch firs and birches had grown up, overshadowing the ground, and *P. minium* had disappeared. So it is with other insects than dragonflies; over-collecting, no doubt, has much to answer for, but, let an insect's habitat be transformed,—for example, if a marsh, let it be drained,—and the place thereof shall know it no more.

There is a large pond away in the depths of the Delamere woods which I have often come across when seeking for the early spring moths. It looks as though its margins had once been cared for, as if some one had thought of making its banks a dwelling-place, had even set about it, and then left it to its silent loneliness. I put it down as a likely place for dragonflies, and so June 24th found me thither bound. But I could not find it, do as I would. The whole neighbourhood looked changed in its garb of ferns and green leaves; the pond was hidden, and I could not get a sight of it. So I gave it up for the time, took my bearings from the sun (a trick taught by sad experience), and made my way to some marshy, ditchy, unfrequented ground. There I came across *P. minium*, as I had never met with the species before, in hundreds.

I think *Æschna juncea* has not been as plentiful with us as in other seasons; but *Æ. grandis* was quite up to its usual numbers. The excessive heat and drought dried up many of *juncea*'s ponds and marshes, while the deeper pits of *grandis* survived. What an interesting dragonfly *Æ. grandis* is,—how voracious, and almost nocturnal! Hold him by the wings, and he will coolly bite anything from a nail down to cotton-wool. He will bite your finger if you present it to him, but without animosity. His ruling passion is simply something to eat. I have frequently tried his biting powers, but my epidermis always turns his mandibles; and I have not yet persuaded anyone thinner skinned to submit to the experiment. As to his nocturnal habits, I saw one hawking along a hedge in the deep twilight of a still, warm August night,—date, August 6th; time, 8.30. The rising moon was just above the horizon, showing its light on the fleecy clouds and on the white mist hanging over the meadows. One day in August I found *grandis* and *juncea* flying together over a dried-up river-bed in North Wales; on the adjacent woody heights *juncea* was alone. *Grandis*, in fact, prefers the lower grounds. The last I saw of *juncea* for the season was on August 21st; of *grandis* on the evening of September 4th,—time 7 o'clock, very dusk, and the city lamps lit.

On August 14th *Ischnura elegans* appeared again, fresh and fine, at a pond where it had not occurred since May; surely a second brood?

On August 21st I found *Libellula quadrimaculata* and *Leucor-*

rhinia dubia over on the Delamere heaths. The place of the latter was taken by lots of *Sympetrum scoticum*. One afternoon in July, just as the sun was getting near the horizon and I was facing west for home, I came across numbers of *L. quadrimaculata* resting on the tops of the heather. Unlike *Æ. grandis*, they retire early. There they were, at varying intervals, with their wings spread out and glistening, for all the world like distant windows in the setting sun. Far away, for a long distance on the heath, I could easily make them out.

My last dragonfly hunt at Delamere was on August 21st, when I went in quest of *Lestes sponsa*, a charming insect with its bronze green, chocolate bronze, and cobalt blue,—and all fast colours! The day was unfavourable,—showery-looking, and with a strong south-west wind. I stirred up two or three; but I was indebted to another romance for the lot I netted. When about tired out, we spied, miles away to the south-west and just on the sky-line, a bit of black cloud. This represented a drenching shower rattling along as fast as an express train. “Now, my friend,” said I, “we shall have to go all round the marsh before we reach those trees on the other side only fifty yards off us in a straight line, and we shall meet the shower! But stay! let us try crossing the marsh itself, which here appears dried up.” Away we go where, possibly, foot rarely crossed before! Let the crust give way, and down we go full fathom five! But we are across, the sun still shines, and *L. sponsa*, sheltered by the wood, is on the wing in hundreds. A glance at the nearing shower shows that we have beaten it hollow, and with several minutes to spare. These are made good use of, and, as we settle down behind fern and heather and under leafy canopy, we pin out our *sponsa* from the cyanide-bottles while the storm raves and splashes overhead.

As it appears that many of the brethren are taking up this fascinating group, let me presume to offer a word or two of advice on setting. Set your dragonflies on the flat. Abhor the “saddle.” For when did any dragonfly—I had almost said any insect—ever curve its wings! Let the grooves be wide enough to admit the legs and thorax. Let them be deeply corked and then papered,—the paper just high enough in the groove so that the top of the thorax is on a level with the board. Use black pins. I use Kirby, Beard & Co’s. No. 4 for large, and No. 9 for small dragonflies. Let the pins stand perpendicularly. Lift up the wings and set the legs first, the paper in the groove will show them up well. Next set the wings with card-braces and paper; the upper slanting a trifle upwards, the lower a little downwards. Then see that the body is perfectly straight. Last, but not least, set the head, not looking waggishly to the right or left, or despondingly down, but straight and flat on the paper.

Chester: November 9th, 1897.

A NEW SETTING-BOARD.

By GEO. O. DAY.

To those lepidopterists who are dissatisfied with the ordinary method of setting, and their name ought to be legion, it may be of some service if I made generally known, through the pages of the 'Entomologist,' a setting-board of my own contrivance, that I have used for the last seven or eight years with very satisfactory results, both as regards the insects set and the time taken in setting.

The main difference between my boards and those ordinarily used lies in the substitution of glass for the card-board or tracing-paper braces. I understand that loose pieces of glass are used by some entomologists on the Continent, and probably also at home, but the advantage in my contrivance is that the pieces of glass are hinged on to the sides of the boards.

A glance at the accompanying illustration will give a general idea of the method.

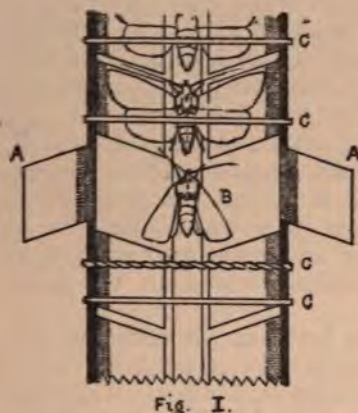


Fig. I.



Fig. II.

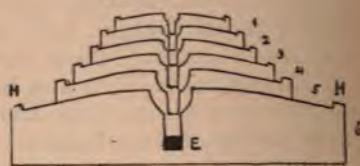


Fig. III.

I will first describe the *modus operandi*, and afterwards give some particulars of the construction of the board. I may mention that the present form is the result of eight years' trial and improvements.

Method of Setting.

The pair of little glass "shutters" are thrown open as shown at AA, Fig. I. (a stout needle with about half an inch of the point end bent at right angles and fixed in a handle is the best kind of instrument to use). The moth or butterfly is then pinned into the groove. In a properly relaxed insect some parts of the wings will naturally lie on the surface of the board, as at B, Fig. I. The glasses are then turned back into their original position, but now they will be covering some part of the wings,

and are held down by a small elastic string-band. (These bands are marked c.) The glass on one side must then be levered up by the little implement before mentioned, just sufficient to admit of the wing being moved up into its place by an ordinary setting-needle. When the wing is in its right position the glass must be allowed to rest on it to hold it in its place. The under wing is next treated in the same manner, only care must be taken that the upper wing does not slip back during the process. The other side of the insect is then dealt with. A great advantage of the glass is that the operator can see to make the two sides perfectly symmetrical.

Both hands must of course be used in the operation—one to lever up the glass, and the other to move the wing into position.

Description of Board.

The materials used are wood, glass, paper, strip of cork, two strips of fine muslin or other thin material, and glue.

The boards are made of wood, and are papered on the surface, including the rounded part of the central groove. A strip of cork is inserted at the bottom of the groove (e) to receive the pin on which the body of the insect is placed. This groove must be made of a depth to suit the taste of the setter (see observation at the end). The shape of the surface of the board is a very important matter, both as to the curve it is intended the wings are to take, and the flatness of the surface where the glasses (gg, Fig. II.) impinge upon the wings; the flatness must of course extend far enough for the glasses to impinge upon the under wings as well (points ff, Fig. II.). The glasses themselves extend beyond these points, in fact nearly to the body groove (to kk, Fig. II.).

There is a narrow raised beading of wood (hh, Fig. II.) at the two sides of the board, of the thickness of the glass, and to this beading the pieces of glass are hinged, by glueing on a strip of muslin or other thin material (ll, Fig. II.). Paper will do, only it is not so durable.

It will be found convenient to leave a small space between each pair of glasses, in order to arrange the antennæ with a moist camel's-hair brush after setting the wings.

The glasses are pressed to the board by a narrow elastic band placed over each pair. These bands entirely encircle the board, and are moved backwards off the glasses and forwards on to the glasses again, by rolling.

For the guidance of any one who wishes to make this kind of board the diagram (Fig. III.) is given. The sizes—viz. width of board and relative depth of groove—are those which by experience are found to be most useful. And the contour of the surface is recommended for those who adopt the curved style of setting.

I do not presume to do more than suggest the shape as a slightly one of its kind, and the height serviceable; but is it too much to hope that we shall ever have a "standard" shape and a "standard" height of setting? What a difference it would make in the appearance of our collections if we had!

[All the drawings kindly furnished by Mr. Day were actual size, but for the purpose of reproduction here they have been reduced about one-half.—ED.]

Knutsford: December, 1897.

A LIST OF THE HYMENOPTERA-ACULEATA OF THE IPSWICH DISTRICT.

By CLAUDE MORLEY, F.E.S., &c.

(Concluded from p. 17.)

ANDRENA, Fab. (contd.)

183. *coitana*, Kirb.—"This has been taken only by my ingenious friend, the Rev. James Coyte, of Ipswich, by whose name I have called it [A D. J. Coyte, entomologo Gippovicensi, mihi, transmissa], and whose cabinet contains many other very rare insects" (*Kirby*, who, however, also records it under the name *shawella*, from Barham); Bentley Woods, August, 1895.
184. *fulvugo*, Chr.—Barham; frequent on flowers in grassy places July, 1799 (*Kirby*).
185. *labialis*, Kirb.—A single female taken on hawthorn blossoms near Ipswich in 1898.
186. *minutula*, Kirb. (2nd brood).—Barham (*Kirby*); not rare, Clopton and Grundisburgh.
parvula, Kirb. (1st brood).—Barham (*Kirby*); common in the spring on dandelions, &c.
187. *nana*, Kirb.—Twice taken at Barham (*Kirby*). Not uncommon.
188. *proxima*, Kirb.—Barham; rare (*Kirby*); one female on Umbelliferæ at Great Blakenham, June 10th, 1897 [E. M. M., Dec., 1897].
189. *dorsata*, Kirb.—Very frequently in flowers at Barham (*Kirby*); rare; one female at Baylham, by the Gipping, July 24th, 1897.
140. *afzeiella*, Kirb.—Barham (*Kirby*); rare; not seen in the Ipswich district since 1898.
var. fuscata, Kirb.—Barhamiæ, Maio medio 1800 in floribus lecta (*Kirby*).
var. convexiuscula, Kirb.—Barham (*Kirby*).
141. *wilkella*, Kirb.—Barham (*Kirby*); not rare; beaten from bushes; Foxhall, Bentley Woods, &c.
142. *similis*, Sm.—Bentley Woods; females beaten rarely from *Populus alba* in 1897.

DASYPODA, Latr.

143. *hirtipes*.—Barham (*Kirby*).

CILISSA, Leach.

144. *hæmorrhoidalis*, Fab.—Barhamiæ in floribus Campanulæ rotundicolæ et Trachelii (Kirby).

145. *leporina*, Panz.—Uncommon on the banks of the Orwell and in Bentley Woods. I should suspect this to be the species to which Kirby refers, if the synonymy were less lucid.

PANURGUS, Panz.

146. *calcaratus*, Scop.—One taken on Martlesham Heath (Kirby).

147. *ursinus*, Gmel.—In Suffolciâ a nobis semel lecta, Septembre ineunti 1797, in ericeto dicto Martlesham Heath (Kirby).

NOMADA, Fab.

148. *fuscata*, Panz.—Barham; rare 1799, (Kirby).

149. *solidaginis*, Panz.—Barham and Martlesham Heath in ragwort flowers (Kirby); Bentley Woods, Foxhall, and Bixley, common.

150. *succineta*, Panz.—In flowers of *Ribes grossularia*, Barham (Kirby); not common; Bentley Woods, &c.

151. *lineola*, Panz.—“Barhamiæ, in floribus Geranii reflexi, in Salicis capreæ amentis” (Kirby).

152. *alternata*, Kirb.—In flowers of *Ranunculus bulbosus* and *Ribes grossularia* at Barham (Kirby); somewhat common.

153. *jacobææ*, Panz.—Taken in flowers of *Senecio jacobææ* at Barham, September, 1799 (Kirby); very rare; Bramford Marshes, on ragwort, on Aug. 7th, 1897.

154. *lathburiana*, Kirb.—Near Woodbridge (Kirby).

155. *guttulata*, Schk.—The second British specimen, found sitting on a composite flower at Bentley Woods, May 17th, 1897. [E. M. M., December, 1897].

156. *ruficornis*, Linn.—Barham (Kirby); Common.

157. *ochrostoma*, Kirb.—Taken very rarely in 1894 near Ipswich.

158. *fabriciana*, Linn.—Very rare at Barham (Kirby).

159. *flavoguttata*, Kirb.—Very rare at Barham (Kirby).

160. *furva*, Panz.—Very rare at Barham (Kirby).

EPEOLUS, Latr.

161. *productus*, Thoms.—Common at Foxhall, Bentley Woods, and Bramford, upon ragwort, and at burrows of *Colletes daviesana*, upon which it is parasitic. This is probably Kirby's *Apis variegata*, which he took at Barham in August, 1797 and 1798.

162. *rufipes*, Thoms.—Rare; occurred with the above at Foxhall in 1895 and 1897.

MELECTA, Latr.

163. *armata*, Panz.—Barham (Kirby); not very common; Ipswich, and boring into the clay banks of the Orwell.

CÆLIOXYS, Latr.

164. *quadridentata*, Linn.—Ipswich; common (Rothney).

165. *elongata*, Lep.—Barham (Kirby); rare; Foxhall in August, 1897.

MEGACHILE, Latr.

166. *maritima*, Kirb.—“In maritimis, prope Landguard Fort in Suffolciâ semel lecta” (Kirby), and I have since taken it commonly on the same spot.

167. *willughbiella*, Kirb.—Barham (Kirby); one at a post in Bentley Woods, in which was a colony of *Odynerus sinuatus*.

168. *lignisea*, Kirb.—Barham (Kirby).

169. *canadensis*, Linn.—Barham (Kirby); by the stream
Bentley dist.
170. *lucorum*, Fab.—Barham with *A. nigrum* in the
Bentley dist.
171. *montana*, Linn.—A common fly from Halesworth, A
Bentley dist.
172. *montana*, Fab.—Barham; common throughout the day.
173. *montana*, Linn.—Barham; common throughout the day.
174. *montana*, Linn.—Barham; common throughout the day.
175. *montana*, Linn.—Barham; common throughout the day.
176. *montana*, Linn.—Barham; common throughout the day.
177. *montana*, Linn.—Barham; common throughout the day.
178. *montana*, Linn.—Barham; common throughout the day.
179. *fulvicornis*, Panz.—Rarely at Barham in thistles, in the
(Kirby).
180. *aurulenta*, Panz.—Hedley (Kirby). [This is synonym
female of *A. fulvicornis* the male = *A. montana* Linn.]
181. *leucomelana*, Kirby.—Codicellanae, prope Needham in
Suffolcia in floribus Leonidionis, semel lecta (Kirby).
182. *spinulosa*, Kirby.—Rare at Wymsham and Little Bl
(Kirby).
183. *bicolor*, Schk.—One taken at Barham, and twice at Gre
ham (Kirby).
- CERATINA, Latr.
184. *cyanea*, Fab.—Once taken in Barham, in the flowers c
jacobae, in the autumn of 1799 (Kirby).
- EUCERA, Scop.
185. *longicornis*, Linn.—Barham (Kirby); not uncommon
Bentley district.
- ANTHOPHORA, Latr.
186. *retusa*, Linn.—Exceedingly rare; the only Suffolk speci
female I took at Ipswich in 1893.
187. *pilipes*, Fab.—Barham (Kirby); common on flowers.
188. *furcata*, Panz.—Occurs sparingly in the Bentley Woods.
- SAUROPODA, Latr.
189. *bimaculata*, Panz.—“Circa aggerem apricum prope We
volitantem feminam bis cepi” (Kirby).
- PTERYGIUS, Lef.
190. *rupestris*, Fab.—Barham (Kirby); common on ragwort.
191. *vestalis*, Fourc.—Barham (Kirby); not uncommon.
192. *barbutellus*, Kirby.—The males frequent in thistles at
(Kirby).
193. *compunctus*, Panz.—Barham (Kirby); probably common,
have never taken it.

BOMBUS, Latr.

195. *venustus*, Sm.—Very common.
 196. *agrorum*, Schmied.—Barham (*Kirby*); very common.
 197. *latreillellus*, Kirb.—Barham, on thistles (*Kirby*); Foxhall.
 198. *hortorum*, Linn.—Barham (*Kirby*); somewhat common.
 var. *harrisellus*, Kirb.—Barham (*Kirby*).
 199. *schrinshirani*, Kirb.—Rare in flowers at Barham (*Kirby*).
 200. *pratorum*, Linn.—Barham (*Kirby*); very common. Kirby named a variety of this insect *burrellana*, "in honorem Rev. D. Burrell, insectorum Collectoris assidui." Probably this was the Rev. J. Burrell, F.L.S., who first took *Pogonus burrellii*, Curt. (now *luridipennis*, Germ.) in Britain in 1806.
 201. *sylvarum*, Linn.—Barham (*Kirby*); somewhat common.
 202. *derhamellus*, Kirb.—Barham; rare (*Kirby*).
 203. *soroensis*, Fab.—Once taken at Witlesham (*Kirby*); Ipswich (*Rothney*).
 204. *lapidarius*, Linn.—Barham (*Kirby*); common.
 205. *terrestris*, Linn.—Barham (*Kirby*); common.
 var. *lucorum*, Sm.—Barham (*Kirby*); Bentley Woods.
 APIS, Linn.
 206. *mellifica*, Linn.—Common, but, as Mr. Saunders says, rarely, if ever, found wild.

NOTE.—I have heard from my friend Mr. Ernest E. Austen that Mr. A. Piffard collected some good things in this order at Felixstowe during August, 1896, but I had no time, before sending in these notes, either to write to Mr. Piffard or examine the specimens taken.

CODE OF LAWS OF THE ENTOMOLOGICAL CLUB.

At the Meeting of the Entomological Club, held at the Holborn Restaurant, on Tuesday, January 18th, 1898, the following new Code of Rules was proposed by Mr. S. Stevens (the senior Member of the Club), and seconded by Dr. P. B. Mason, Mr. G. H. Verrall being in the chair; the other Members present being Messrs. G. T. Porritt, T. W. Hall, and R. South.

PREAMBLE.

Whereas an Entomological Club established in London in the year 1826 for the purpose of social meetings at the residences of its members for the communication of facts, the comparison of notes, the naming of specimens, and mutual improvement in the science of Entomology has existed and met from time to time; and whereas the Code of Laws adopted in 1836 has continued with very slight alterations until the present time; and whereas that Code of Laws has become antiquated: IT IS RESOLVED AND AGREED, that all former Rules and Regulations shall cease and determine, and the following be adopted as the Laws of the Club.

CODE OF LAWS.

I.—That this Club be entitled the ENTOMOLOGICAL CLUB.

II.—That the Club consist of eight Members.

III.—That the Club may elect an unlimited number of *Honorary Corresponding Members*.

IV.—That any vacancy occurring in the Club be filled up by election from the Honorary Corresponding Members.

V.—That a Candidate for Membership be proposed and seconded at an ordinary Meeting of the Club, and be balloted for at the next Meeting. A single negative to exclude.

VI.—That the Honorary Corresponding Members have an equal right with the Members to attend the ordinary Meetings of the Club; and to introduce Visitors, either personally or by letter, according to the Regulations provided from time to time, to inspect the Collection.

VII.—That no subscription or pecuniary consideration whatever be an essential qualification to Membership in this Club, but that all voluntary contributions from Members, Honorary Members, or others, be received and applied to the purposes of the Club.

VIII.—That a Secretary and Curator be appointed to hold office until resignation, disqualification, or notice of removal from office by resolution carried at some ordinary Meeting of the Club.

IX.—That each Member of the Club shall, if possible, hold a Meeting of the Members each year and be chairman thereof. Two to form a quorum.

X.—That the property of the Club be vested in two Trustees elected annually, and that none of it be alienated unless a majority (consisting of not less than four) of the Members are in favour of the same.

XI.—That no Member shall possess any right or property in the Club disposable either during life or by testament.

XII.—No alteration in these Laws shall be made unless at least four Members (being a majority of those present) vote in its favour; due notice of the proposed alteration having been given at least ten days before the Meeting.

XIII.—That every present and future Member of the Club shall be bound to abide by these Laws, unless altered as provided by Law XII.

NOTES AND OBSERVATIONS.

THE RHOPALOCERA OF BIRMINGHAM AND DISTRICT.—The following is a list of the Diurni occurring within a radius of twelve miles of the city of Birmingham. I published a list of the Sphingidæ of the same district (*Entom.* xxx. 239). Nearer the city insects were much more abundant than at present, but the rapid strides of the builder have unfortunately proved effectual in the destruction of many species; however, beyond his reach insects abound in the "Warwickshire lanes," which happily still retain their natural aspect and beauty. The district under consideration comprises no extensive heaths or

woodlands, and the country bears a very uniform appearance, together with but little variation of the soil, and consequently the number of species to be met with is not large. The following is a complete list, as far as I have been able to ascertain, chiefly by means of my own observations. It includes thirty-six species:—

Pieris brassica. By no means plentiful some years, and very intermittent in its appearances. I do not ever remember seeing it really common in the suburbs of Birmingham.—*P. rapæ*. Very common.—*P. napi*. Also common, but the first brood is often considerably rarer than the second.

Leucophasia sinapis. This insect is unfortunately approaching extinction in the midlands; there is but one locality in the district for it, and it is scarce there.

Euchloë cardamines. Plentifully distributed in the lanes; females are often unusually large.

Gonepteryx rhamni. This insect is fairly common in many localities, but I very seldom meet with it around here (Moseley). The buckthorn is by no means a common and generally distributed plant in this part.

Colias edusa. A scarce visitor; one or two examples have been noted at various periods in Sutton Park, and lately one has been captured near Knowle.

Satyrus egeria. Not common, and is rather local, and seems to be getting scarcer.—*S. megæra*. Fairly abundant.

Epinephele ianira. Common throughout the district.—*E. tithonus*. Common in some localities, such as Sutton Park, but does not seem to be very evenly distributed.—*E. hyperanthus*. Thinly dispersed in most parts.

Cænonympha pamphilus. Common; is especially abundant in Sutton Park, where it varies to a very considerable degree. The ocelli are often very well developed on the upper side of the primaries; on the secondaries, underneath, they are conspicuously absent occasionally, at other times so well developed as to form an almost unbroken band.

Vanessa urtica. Very common.—*V. atalanta*. Abundant everywhere; in 1895, with the exception of *Pieris rapæ*, it was the commonest butterfly of the year.—*V. io*. Fairly plentiful, but irregular in its appearances. The last three years I have hardly seen a dozen examples.—*V. polychloros*. Used to be by no means uncommon, but is now comparatively seldom seen.—*V. antiopa*. Sir Francis Scott records a couple at Great Barr in the 'Entomologist' (1880). Single examples have been seen at Moseley and in Sutton Park, but several years ago.—*V. cardui*. Not often visits. Observed a worn example last year; was probably a far-travelled individual.

Argynnis paphia. Local; Sutton Park, where it is often rather abundant.—*A. adippe*. Sutton Park; scarce.—*A. euphrosyne*. Lanes, &c., around Knowle, Flockley Heath, Coleshill, also Sutton Park; but not very common.—*A. selene*. Occurs in the above localities, but is more restricted to a few favoured haunts.

Melitæa artemis. Rare and local; near Umberslade (Worcester).

Thecla rubi. Plentiful in Sutton Park, especially at the flowers of

holly, which grows in greater abundance there than at any other place that I am aware of in the county.—*T. quercus*. Chiefly at Sutton.

Lycæna argiolus. Generally distributed in the holly-bounded lanes around Hall Green and Yardley Wood; plentiful near Coleshill; in Sutton Park during some years it absolutely swarms. Have never seen the second brood here.—*L. ægon*. Heaths in Sutton Park, also near Coleshill; but is often scarce.—*L. acis*. Occurred around Shirley many years ago, but picture dealers and others have long banished the species.—*L. icarus*. Common everywhere in the rural district.

Polyommatus phleas. In abundance; "bleached" examples are frequent in Sutton Park, chiefly females. The males often have the coppery colour much intensified, and the black edging of the wings considerably widened.

Syrichthus malva. Plentiful.

Thanaos tages. Local; railway embankment, Sutton Park, and elsewhere.

Hesperia linea. Common.

H. sylvanus. The commonest "skipper."—AUGUSTUS D. IMMS; "Linthurst," Oxford Road, Moseley, near Birmingham.

EPIONE PARALLELARIA, Schiff. (= *E. VESPERTARIA*, St.) IN SCOTLAND AND THE NORTH OF ENGLAND.—With reference to the notes on the capture of this moth in Scotland, which have appeared in the last two numbers of the 'Entomologist,' it may not be without interest to record that I have a specimen—a rather worn female—which I took at Newham Bog, in North Northumberland, on Aug. 20th, 1890. This is the only instance in which I have met with this insect in this district, but, as I have elsewhere pointed out ('History of Berwickshire Naturalists' Club,' vol. xv. p. 299), there is a record for Learmouth Bog so long ago as July 30th, 1863. Learmouth is not more than a mile, as the crow flies, from the Scottish border, and about eighteen miles from Newham. I have not seen the Ent. Mo. Mag. containing the Hawick records, but further particulars of the captures would, I am sure, be of interest to North Country entomologists.—GEORGE BOLAM; Berwick-on-Tweed, Jan. 10th.

HELIOTHIS ARMIGERA IN SOUTH DEVON.—I have read with much interest your paper on *H. armigera*. I think there can be no doubt that this insect is truly indigenous in S. Devon. It was taken regularly for years, between 1860 and 1870, at Torquay, by Mr. Terry, a famous local entomologist, at ivy bloom; and in October, 1869, I saw a specimen that had been taken on the previous night at arbutus flowers, by another entomologist, who told me that he took one or two every year. This, of course, was before tomatoes were imported in any very large quantity, and I do not think that imported tomatoes were much sent into S. Devon at that time. Last August, about the 15th, the Rev. Dobrée Fox and myself took one specimen at sugar in S. Devon, which fell to his share, and which is now in his cabinet. It was taken close to a barley field, in which was an undergrowth of clover. I think that following the reaping machine in similar fields might lead to the capture of more specimens, but fine weather would be necessary, and that we did not often get.—F. C. WOODFORDE; Market Drayton, Salop, Jan. 2nd, 1898.

HELIOTHIS ARMIGERA.—With reference to your note on *H. armigera*, it might be interesting to you to know that I obtained from a fruiterer's shop in Poole a larva, which had been received in a consignment of tomatoes from Portugal (what part I do not know), which answered fairly well to the description of the larva of *H. armigera*, and emerged on Oct. 1st, 1897, as an imago of that species, though so much crippled on one side as to be useless as a specimen.—W. PARKINSON CURTIS; Aysgarth, Longfleet, Poole, Jan. 9th, 1898.

I was very interested in your remarks on this species, *ante*, p. 17. I may add that I get larvæ yearly from imported tomatoes. Last season they were all from Canary Island fruit, and I only reared two moths.—J. ARKLE.

PREOCCUPIED NAMES.—It may be well to call attention to the following names, lately proposed for insects, which are preoccupied. It may be left to their authors to find substitutes:—

Astatus, Péringuey, Tr. S. African Soc. viii. 237. This name properly belongs to a well-known genus of Fossorial Hymenoptera.

Harpalus fallax, Péringuey, *t. c.* 444. Not *H. fallax*, Leconte.

Dejeania, Oberthür, Etudes Ent. xx. p. 40. This name properly belongs to a genus of large Tachinid flies.

Paryphanta, Karsch, Ent. Nachr. xxii. 267. The name rightly belongs to a genus of Mollusca.

Andrena sodalis, Cameron, Mem. Manchester Soc. xli. No. 4, p. 121.

Not *A. sodalis*, Smith, a Mexican species.

Halictus picipes, Cameron, *t. c.* p. 101. Not *H. picipes*, F. Morawitz.

Halictus amœnus, Bingham, P. Z. S. 1896, p. 451. Not *H. amœnus*, Spinola.—T. D. A. COCKERELL; Mesilla Park, New Mexico, U.S.A., Dec. 19th, 1897.

PRODENIA LITTORALIS IN ENGLAND.—On Nov. 26th last I received from Mr. C. Bartlett, of Bristol, a moth which he had bred on Aug. 3rd. I had no difficulty in identifying the insect as *Prodenia littoralis*, and advised him to that effect, at the same time asking for further information. Unfortunately Mr. Bartlett does not appear to be able to fix the exact locality where he obtained the larva, but thinks that he found it on dock at Brockley. In 1890 Mr. Boden bred an example of this species from a larva found feeding on an imported tomato, and it occurs to me that probably the larva which produced the imago now referred to may have come into this country among tomatoes or other imported produce. According to Hampson (Fauna, Brit. Ind. Moths, ii. p. 246) *P. littoralis* occurs in the Mediterranean subregion and throughout the tropical and subtropical zones of the Old World. Kirby ('European Butterflies and Moths,' p. 237) states that the imago is found in March and April, and the larva from November to February feeding on low plants. The species was described by Boisduval in 1834 as *Hadena littoralis* (Faun. Ent. Madag. Lép. p. 91, pl. xiii. fig. 8), and it has been redescribed twice by Guenée, and under three different names by Walker; *Neuria retina*, Freyer, is also a synonym.—RICHARD SOUTH.

CAPTURES AND FIELD REPORTS.

NOTES ON SUFFOLK LEPIDOPTERA IN 1897.—The year 1897 can hardly be regarded as a record one from an entomological point of view. Lepidoptera were decidedly scarce in and around Ipswich; hence but few pages were utilised in the diary from which the present notes are extracted. The following note may be quoted as a general remark on the earlier months of the year:—"Moths decidedly scarce; weather cold and unsettled, with a continuance of winds right up to June, consistent with generally accepted theory that if the sun crosses the line on March 21st in bad weather, the same will continue till the longest day. In May, generally the best month for collecting, had quite an empty diary. Micros conspicuous by their absence." *Hybernia rupicaprararia* and *Anisopteryx æscularia* ought to be excepted from the foregoing remarks. The former was very common at light in February from the 5th. In the concluding summer and autumn months gloriously fine, dry weather was experienced, the driest in fact since a quarter of a century back, but the scarcity of moths was truly remarkable.

Nothing of exceptional interest was taken amongst the Macros except specimens of *Acidalia trigeminata*, *Lobophora sexalisata*, and *Hecatera serena*, on tree-trunks; and *Chærocampa elpenor*, on the wing at dusk. Visiting Bentley Wood towards the end of May, solitary specimens of *Nemeobius lucina*, *Gonepteryx rhamni*, and *Thanaos tages* were netted. The latter, like *Vanessa io* and *V. urticae*, were very dilapidated. *Anthocharis cardamines* and *Lycæna argiolus* were common, the latter on holly blossom. *Argynnis euphrosyne* abounded, in lovely condition, and several *Pieris brassica*, which were rare in 1896, were noticed on the wing.

Amongst the list of the Micros are several which have only been recorded once before in the county. The following were taken in June:—*Elachista rufocinerea*, *E. cygnipennella* (common), *Xanthosetia hamana* (at Offton), *Argyresthia retinella* (on palings in Belstead), *A. nitidella* (common), *Antithesia pruniana* (less common than usual), *Spilonota roborana*, and *S. rosæolana*, *Conchylis straminea*, *Tortrix viridana*, *Sericoris lacuana*, *Gelechia terrella* (flying commonly amongst buttercups at Bentley), *Eudorea pyralella*, *E. ambigua*, and *E. mercurella*, *Gelechia proximella* (common on oak-trunks), *Roxana arcuella*, *Crassia bergmanniana*, &c. The July captures include *Tinea biselliella* (in swarms in my house), *T. ferruginella*, *Gelechia affinis*, *Spilonota ocellana*, *S. sufficiens* (*trimaculana*), *Ecophora pseudo-spretella*, and *E. fuscescens*, *Eudorea cembra*, *Phibalocera quercana*, *Phoxopteryx uncana* (in cop. on honey-suckle). The following were detected under wall ledges:—*Gelechia fugitivella*, *Ecophora lambdella* (two fine specimens of this species—rare in Suffolk), *Pedisca bilunana*, *Hyponomeuta padellus*, *Bupalis argyrestella*, *Batodes angustiorana*. The records of the Suffolk list were augmented on Aug. 7th by two species, one (*Dasycera oliverella*) taken at Stratford St. Mary, and the other (*Peronea comparana*) at Nayland. Both places are distantly situated from Ipswich. At the former town I boxed *Harpipteryx xylostella*, *Gelechia maculea* (several seen on birch-trunks), *Bactra lanceolana*, *Ebulea crocealis*, and *Dicrorampha politana*. During the same month I discovered that the stone parapets of railway bridges were very productive of insects just before sundown. By this means I added *Ecophora tinctella* (Ipswich), *Tinea cloacella*, *Glyphipteryx syringella*, *Lithocolletis corylifoliella*, *L. sylvella*, *Lyonetia clerckella*, and other more

common species. The records for the year were concluded in September by the capture of *Depressaria subpropinquella* and *Argyresthia brockella*.—CLAUDE A. PYETT; Ipswich, December, 1897.

AGROTIS OBSCURA AND ACRONYCTA STRIGOSA IN GLOUCESTERSHIRE.—One specimen of each of the above was taken by me at sugar last June. I believe the latter has not been previously reported from this part of Gloucestershire. *C. octogesima*, one at light and at sugar, and *A. cinerea*, eight at light, were also taken.—J. D. BIRCHALL; Bowden Hall, near Gloucester, Jan. 6th, 1898.

EARLY APPEARANCE OF PHIGALIA PEDARIA (PILOSARIA).—I took a fine male *P. pedaria* off a gas lamp outside Chester on Dec. 18th. The earliest appearance of the moth I can find is Nov. 27th, 1881 (Entom. xx. 110).—J. ARKLE; Chester.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Annual Meeting, January 19th, 1898.*—Mr. Roland Trimen, F.R.S., F.L.S., President, in the chair. The balance-sheet for the past year, showing a balance in favour of the Society, and an improvement in the financial position, was read by Mr. A. H. Jones, one of the Auditors. The Secretary then read the Report of the Council, from which it was seen that during 1897 the Society had lost 7 Fellows by death and 5 by resignation, and had elected 24, the total number now upon the list being 398. The Transactions for the Year contained 19 memoirs, illustrated by 11 plates, and extending to 484 pages. As a mark of respect to the late Mr. J. W. Dunning, the Council had decided to present his portrait as a frontispiece to the volume of Transactions for 1897. It was announced that the following Fellows had been elected as Officers and Council for 1898:—President, Mr. R. Trimen, F.R.S.; Treasurer, Mr. R. McLachlan, F.R.S.; Secretaries, Mr. W. F. H. Blandford and Mr. Frederic Merrifield; Librarian, Mr. G. C. Champion; and as other Members of Council, Mr. W. Bateson, F.R.S., Dr. T. A. Chapman, Sir G. F. Hampson, Bart., Mr. M. Jacoby, Mr. A. H. Jones, Dr. P. B. Mason, Mr. O. Salvin, F.R.S., Mr. J. W. Tutt, Mr. G. H. Verrall, and Mr. C. O. Waterhouse. The President nominated as Vice-Presidents, Sir George Hampson, Mr. McLachlan, and Mr. Verrall, and his Address was then read on his behalf by the Secretary. After briefly reviewing the position of the Society, and referring to the losses of the past year through deaths within and without the Society, particularly those of Dr. Fritz Müller, Mr. J. W. Dunning, Captain E. Y. Watson, Dr. G. H. Horn, the Rev. A. Matthews, and Herr Rogenhofer, the President proceeded to review the subject of Mimicry. The historical development of the theory by the work of Bates, Wallace, and the President himself, together with the later amplifications of the Batesian theory by Müller, Meldola, Poulton, Haase, and Dixey, was traced. An account was next given of the forms of mimicry existing outside the Lepidoptera, and in the order itself a general summary was made of the relationships, as model or mimic, existing among Rhopalocera, Heterocera, and between these two suborders respectively, the group of phenomena exhibited by *Papilio merops*, P.

cenea, *P. meriones*, *P. antinorii*, and their allies being discussed in detail. He next dealt with the evidence on points such as the persecution by insectivorous foes, and with respect to attacks by birds, admitted the poverty of existing evidence, but concluded that this was largely due to the neglect of well-directed and sustained observation, and that what had been published went far in the direction of proving that birds must still be reckoned among the principal enemies of butterflies. He congratulated the Society on the fact that the chief part in investigating and generalizing on this subject had been borne by its Fellows, and concluded with an earnest appeal for the establishment of biological stations, similar to marine stations, for the study of the terrestrial fauna of the tropics under favourable conditions. On the motion of Lord Walsingham, seconded by Mr. F. D. Godman, a vote of thanks to the President, for his able summary of the subject and his services during the year, was carried by acclamation; and the proceedings terminated with a vote of thanks to the other officers, moved by Professor Poulton, seconded by Col. Yerbury, and acknowledged by Mr. McLachlan and Mr. Blandford.—W. F. H. BLANDFORD, *Hon. Sec.*

RECENT LITERATURE.

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IN order to ensure earlier publication of papers read at the meetings, the 'Proceedings' of this Society are now issued in two parts. The instalment before us comprises nine papers, all of which, with the exception of two on Crustacea by Mr. Step, treat of Lepidoptera, and of these the most important are—"Some Considerations of Natural Genera, and Incidental References to the Nature of Species," by Mr. J. W. Tutt; and "The British Day Butterflies, and the Changes in the Wings of Butterflies," by Prof. A. Radcliffe Grote. All students of systematic entomological work should make a point of reading both these papers, as they deal with some very interesting matters connected with a proper understanding of the subject, and a due appreciation of the value attaching to structural characters in the formation of genera and the higher divisions.

Phylogeny no doubt is the basis upon which classification should be founded; but from the arguments brought forward in the two papers referred to above, it would appear that those who are engaged in this branch of the science are not altogether in accord. It seems that not only the structural details of the perfect insect, but those also of the earlier stages of species, will have to be further enquired into and studied before a system with any claims to stability is likely to be established.

For all practical purposes the arrangement of British butterflies now in vogue is not inadequate, and will probably continue in use for many years to come. The present sequence of species, genera, and families is perhaps hardly less natural than the order in which they are placed in the newer arrangements.

Entomologist, March, 1898.

Plate I.



W. J. Lucas del.

FIG. 1.—*Forficula lemeii*, male ($\times 3$).



FIGS. 2 & 3.—*Chelisoches norio*, male and female ($\times 3$).

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INTERESTING EARWIGS.

By W. J. LUCAS, B.A.

(PLATE I.)

Forficula lesnei, Finot.

Last year Mr. Burr announced that an earwig he had taken on the Warren at Folkestone in September, 1896, and recorded as *Forficula pubescens*, was not that species. For, after examining a figure of it, M. de Bormans had suggested that it should rather be referred to *F. lesnei* of Finot. A further examination of the insect by Mr. Burr and a comparison of it with Finot's figures and description left no doubt that the Folkestone insect was a true *F. lesnei*. A specimen has since been taken at Wallingford in Berkshire; while there is a very old specimen, labelled "Kingstone," in the Hope Collection in Oxford. Lately Mr. W. West gave me a specimen, making the fourth to be recorded, which he took in October last while sweeping on the chalk near Reigate in Surrey, at a spot where *Ononis* was growing profusely. This insect, a male, in good condition, is here figured three times natural size (Plate I. fig. 1).

F. lesnei has been taken amongst rough grass in September in various places in the north-west of France, while *F. pubescens* is essentially a south European insect; consequently it is possible that the specimens of the latter recorded as taken in the Scilly Isles, and at Charmouth, Weymouth, Bonchurch, and Glanvilles Wootton by Messrs. J. C. and C. W. Dale, and at Salisbury by Curtis, may turn out to be *F. lesnei* also, though, of course, both insects may be present in the South of England. This earwig is no doubt native, and is perhaps not so rare as the small number of recorded captures would make it appear; for

it must be remembered that it cannot fly, and therefore to continue the species the male must find the female by help of its legs alone—a state of things which hardly points to the insect being extremely rare. Consequently coleopterists, and others who use a sweeping-net, would do well to examine more closely any earwigs that may be captured.

F. lesnei sufficiently resembles *F. auricularia* to shew it to be a *Forficula*, while the pale colour, absence of wings, and shape of forceps would readily distinguish it from the common species. Four other wingless earwigs have been recorded for Britain, but of these two—*Anisolabis maritima* and *A. annulipes*—have not even wing-cases, while the other two—*Apterygida albipennis* and *A. arachidis*—are much smaller insects. Moreover, not one of the four, possibly excepting *albipennis*, is, I think, likely to be found in a wild state in this country. The male *F. lesnei* differs from *F. pubescens* in the shape of the forceps. In the former the free, curved, forked parts are equal in length to the flattened contiguous parts; while in the latter species the curved parts are much less than half the total length of the forceps. In *F. lesnei*, also, the curved ends of the forceps do not nearly meet, as they do in *F. pubescens*.

Chelisoches morio, Fabr.

Chelisoches morio is a casual visitor in this country, and cannot with any justice be called a British insect. The two specimens figured, three times natural size (Plate I. figs. 2 and 3), were taken in Kew Gardens, whither they came in sugar-cane from Mauritius in August, 1894. Being somewhat cosmopolitan, however, the species may perhaps be met with here again. It is widely distributed in the islands of the Pacific and Indian Oceans, and some of the neighbouring countries.

C. morio is a large, bulky, shining-black earwig, with fully developed wing-cases and wings. The antennæ are of about seventeen joints, and black in colour, except two joints near the tip. The legs are black, with the exception of the tarsi, which are pale yellowish brown, and of which the second joint is extended as a lobe below the third. The male forceps are stout, especially at the base; those of the female are long and pointed.

February 16th, 1898.

ON A GYNANDROMORPHOUS SPECIMEN OF
ADOPEA THAUMAS, HUFN.

BY JAMES EDWARDS, F.E.S.



ADOPEA THAUMAS, Hufn., ♂ ($\times 2.64$).

By the kindness of my friend Mr. H. J. Thouless I have been able to photograph, and through the courtesy of the Editor to publish, the accompanying figure of a gynandromorphous specimen of *Adopæa thaumas*, Hufn. It was captured by Mr. Thouless at Drayton, Norfolk, on August 3rd, 1896.

The genitalia are male, and of the full size; the only abnormal features (so far as can be ascertained without dissection) being much flattening and distortion of the apical lobe of the tegumen, and the presence on the left side of a large supplementary chitinous lobe which appears to spring from nearly the same point as the clasp.

Gynandromorphism amongst the Hesperiidæ appears to be rare; I have not met with any recorded instances, nor have I observed any amongst the large number of Hesperiidæ which I have had occasion to examine during the last few years. My acquaintance with the literature of the subject is, however, much less than I could wish.

That the absence of the sex-mark on the left fore wing of the specimen figured is not merely fortuitous may, I think, be safely conceded when the abnormality in the genitalia is taken into consideration. In this connection it may be well to note that

Mr. Leech (Butt. China, &c., p. 592, pl. xl., figs. 1 and 4, male; 2, female) has described and figured an *Adopæa* from Chang-Yang, Central China, not having a sex-mark on the fore wing of the male, as a variety (*astigmata*, Leech) of *A. leonina*, Butler; but the better opinion would seem to be that originally entertained by Mr. Leech, namely, that *astigmata*, Leech, is a distinct species; since there appears to be no other recorded instance in the Hesperiidæ in which the alar sex-mark of the male is sometimes present and sometimes absent in the same species, and it appears that the sex-mark was wanting in all the males of the form under consideration received from that locality. The fact that the male genitalia in *astigmata*, Leech, are identical in shape and structure with those of *A. leonina*, Butler, merely proves that these organs are of the form common to *A. sylvatica*, Bremer, *A. tenebrosa*, Leech, and *A. leonina*, Butler.

Colesborne, Cheltenham.

DESCRIPTIONS OF SOME NEW SPECIES OF *DORYPHORA*.

By MARTIN JACOBY, F.E.S.

Doryphora venezuelensis, n. sp.

Ovate, very convex, dark fulvous; head and thorax nearly impunctate; elytra very finely punctate-striate, flavous, the sutural and lateral margins, a deeply dentate transverse band at the base, another below the middle, and a triangular spot near the apex, piceous. Length, 10 mill.

Head impunctate and without any impressions, fulvous; antennæ fuscous, the lower six joints fulvous, terminal joints widened, but longer than broad; thorax three times broader than long, the sides strongly rounded in front, rather constricted near the base, the anterior angles not produced into a tooth, the surface impunctate with the exception of a few strong punctures at the sides; a single deeper puncture is also placed at some distance each side of the lateral margin; the elytra are very finely punctured in irregular rows, distantly placed, the darker markings are of a piceous colour, with a distinct metallic-green gloss, and consist of a transverse band below the base, which includes a flavous spot near the scutellum, having its lower edge deeply irregularly dentate, a narrower band below the middle in shape of four elongate connected spots, a triangular spot near the apex; the suture and the lateral margins are of the same colour, the under side and legs dark fulvous, the mesosternal process short, stout, and straight.

Hab. Venezuela.

This *Doryphora*, of which a single specimen is contained in my collection, is evidently allied to *D. landolti*, Steinh. (Mittheil. Ent. Ver. München, 1877), but the author described the thorax as having a tooth or point at the anterior angles, which is not

the case here; the elytra in *D. landolti* are also described as geminate and punctate-striate, and their design is different. *D. balyi*, Stål, is another closely allied species, but has a mucronate and punctured thorax, and the elytra are given with flavous margins and bands.

Doryphora scripta, n. sp.

Flavous; head and thorax closely punctured, stained with obscure piceous spots; elytra distinctly punctate-striate, the sutural and lateral margins, a large subtriangular elongate patch, and a triangular smaller spot near the apex dark fulvous. Length, 10 mm.

Of regular ovately rounded shape; the head closely and finely punctured, obscure fulvous, a narrow space surrounding the eyes paler; labrum broad, flavous, as well as the palpi; antennæ with the lower five joints flavous, the following two fuscous, the others wanting; thorax three times broader than long, the lateral margins slightly rounded and obliquely narrowed towards the apex, the anterior angles acute, but not mucronate, the surface rather crowded with differently-sized small punctures, those at the sides larger; the ground colour flavous, the disc stained with three very obscure piceous spots placed triangularly, the sides with a similar coloured oblique stripe, and another small spot above; scutellum flavous; elytra rather strongly punctate-striate, the punctures closely and not very regularly placed, the interstices finely aciculate here and there; the ground colour and the epipleuræ flavous, the disc with a longitudinal brown sutural stripe, which extends anteriorly as far as the third row of punctures, but posteriorly only to the second row; this stripe is joined at the apex to a similar but narrower band, which accompanies the lateral margins; a large brown subtriangular patch extends from the base to below the middle, and a smaller triangular spot occupies the posterior portion; the elytra may also be described as dark brown, interrupted by a subsutural and sublateral narrow flavous stripe, which is joined by another transverse curved narrow band below the middle dividing the two brown patches; under side and legs flavous, impunctate; mesosternal process stout and slightly curved.

Hab. ?

Somewhat allied to *D. whitei*, Baly, but of different coloration and sculpturing. The single specimen in my collection was obtained by Mr. Whiteley, probably in Colombia.

Doryphora specularis, n. sp.

Pale fulvous or flavous; thorax finely rugose-punctate, with two small spots; elytra closely and strongly punctured, flavous, the lateral margins metallic-green, the suture anteriorly, including a small flavous spot and a broad discoidal longitudinal band pointed posteriorly, piceous. Length, 10 mm.

Of rather depressed, posteriorly deflexed shape; the head finely and rather closely punctured, flavous, the labrum testaceous; antennæ black, the basal two joints flavous below, terminal joints longer than broad; thorax rather more than twice as broad as long, the sides nearly straight, the anterior angles mucronate, the surface irregularly

strongly rugose-punctate, the sides more strongly and confluent punctured, the middle sometimes with a raised line, each side of which a small spot (sometimes absent) is placed; scutellum triangular, flavous; elytra strongly deflexed at the posterior half, strongly, irregularly, and closely punctured at the sides, the punctures arranged in rows near the suture; the lateral margins narrowly metallic-green, this colour preceded by a narrow flavous stripe; a similar stripe accompanies the suture at the posterior two-thirds of its length, and joins the lateral one at its apex, and a small flavous spot is placed at the base each side of the scutellum; the rest of the surface is piceous, with a slight metallic gloss; the epipleuræ, the under side, and legs are flavous and impunctate; the mesosternal process is slightly curved.

Hab. ?.

Of this species I possess two specimens, unfortunately without locality. In the system of coloration they agree somewhat with *D. columbina*, Stål, but the sculpturing of the thorax and other details are quite different. In one of the specimens the small flavous basal spot is almost connected with the sutural stripe; in the other it is well separated by the darker portion of the elytra.

Doryphora castanea, n. sp.

Below black, above fulvous; thorax finely and not closely punctured; elytra as finely punctured, the punctures irregularly arranged, with finely aciculate interstices. Length, 14 mill.

Head somewhat closely punctured, the clypeus separated from the face by a semicircular groove, closely punctured, apex of the mandibles and the palpi black; antennæ not extending much beyond the base of the elytra, black, the lower three joints fulvous below, terminal joints dilated, slightly longer than broad; thorax three times broader than long, the sides strongly rounded and widened at the middle, the anterior angles produced; the disc convex, much depressed laterally, finely and subremotely punctured; scutellum narrowly margined with piceous; elytra irregularly and finely punctured, the punctures here and there arranged in rows, the interstices finely aciculate; under side, with the exception of the flanks of the thorax, black, shining, sparingly punctured; legs rather slender; mesosternal process stout, short, and straight.

Hab. Ecuador, Rio Dogua.

Of this species I possess three specimens. The uniform fulvous colour of the upper side, in connection with the black antennæ, under side and legs, and the fine punctuation, will assist in the recognition of the insect.

Doryphora facialis, n. sp.

Piceous; the antennæ and legs fulvous; head and thorax greenish black, opaque, the margins fulvous; elytra finely geminate punctate-striate, flavous; the suture, a spot on the shoulder, a short transverse stripe at the base, a triangular spot at the suture below the scutellum, and a spot below the middle at the lateral margin, dark green. Length, 10-12 mill.

Head greenish black, opaque, very sparingly and finely punctured; antennæ short, fulvous, the terminal joints broadly flattened; thorax nearly three times broader than long, the sides straight at the base, rounded before the middle, the anterior angles broadly produced, the surface opaque, silky, greenish, the disc with a few fine punctures, the sides with some stronger ones; the anterior margin, the angles, and (sometimes) the sides more or less stained with fulvous; scutellum black, smooth; elytra with their greatest convexity near the base, finely punctured in irregular double rows, flavous, the shoulders and the lateral margins below the middle with a dark green spot, a narrow short transverse stripe directly below the base, a triangular sutural spot below the scutellum, and the suture narrowly dark green; the shoulder spot extends also to the elytral epipleuræ, which are flavous at their other portion, except at their inner margin; the under side piceous, strongly punctured; legs fulvous; the mesosternal process short, flat, and straight.

Hab. Brazils ?

Of this species, which would perhaps best be placed near *D. axillaris*, Germ., two specimens are before me; one in the collection of the Oxford Museum, the other in that of my own. They were probably obtained in some parts of the Brazils. I know of no other species with which it could be confounded, but the system of coloration and general size and shape of the insect greatly resemble that of a species of *Deuterocampta*.

Doryphora brunneostriata, n. sp.

Greenish æneous; the lower joints of the antennæ, the palpi, and the tarsi fulvous; head and thorax flavous, with brownish stripes and spots; elytra subremotely and semi-regularly punctured, flavous, with nine more or less interrupted brown longitudinal stripes. Length, 12 mill.

Head sparingly and finely punctured, flavous, with two brownish stripes in shape of a triangle; the labrum, palpi, and the lower four joints of the antennæ fulvous, the other joints of the latter black, flattened, but rather elongate; thorax three times broader than long, the lateral margins rather rounded and slightly widened in front, the anterior portion strongly produced in front of the eyes, the surface remotely and irregularly punctured; the ground colour flavous, the punctures piceous, the middle of the disc marked with two oblique brown stripes, which, starting from the anterior margin, nearly unite at their ends, and are joined to another irregular shaped transverse band placed at the base; scutellum piceous; elytra with the most convex portion near the base, from thence to the apex strongly deflexed, irregularly and semi-remotely impressed with piceous punctures, here and there arranged in rows, flavous, the interstices marked with nine longer or shorter narrow brownish stripes, leaving the lateral margin rather broadly of the ground colour, their epipleuræ of the latter colour; the under side and the femora greenish piceous; the margins of the abdominal segments and the rest of the legs fulvous; mesosternal process long, stout, and straight.

Hab. Bolivia.

This species, of which I possess a single specimen, seems closely allied to *D. geminipunctata*, Stål, but the thorax in the latter insect is much more strongly punctured, and without the brown stripes; the elytra are regularly geminate-punctate, and their narrow stripes are interrupted anteriorly and posteriorly by a flavous transverse band. For all that, it is possible that the present species is an extreme aberration of Stål's insect, taking into account the great variability of all these insects.

Doryphora ænea, n. sp.

Metallic greenish black below, above obscure æneous; thorax very finely and rather closely punctured; elytra obsoletely and finely punctate-striate, the interstices irregularly and sparingly punctured. Length, 10 mill.

Head finely and somewhat closely punctured, semi-opaque, æneous, the labrum fulvous anteriorly; antennæ extending to the base of the elytra, greenish black, the lower two joints fulvous below; thorax scarcely three times broader than long, the sides nearly straight, the anterior angles not much produced; the disc opaque, brownish æneous, punctured like the head, the extreme basal margin with some rows of stronger punctures; scutellum smooth; elytra wider at the base than the thorax, widened towards the middle, finely punctured in ill-defined rows, the interstices sparingly and very finely punctured and aciculate; the under side and legs more shining and impunctate; the mesosternal process short, but strongly pointed and straight.

Hab. Peru.

A rather small-sized species, allied to *D. prasina*, Erichs., but of rather opaque æneous upper surface and different sculpture.

NOTES ON THE SEASON OF 1897.

By RUSSELL E. JAMES.

ALTHOUGH rather late in the day, the following notes on the past year may perhaps interest some of your readers. 1897, as I found it, has been a most irregular year; and although I have not had as much time as usual for collecting, the results of the few expeditions I have made have been curiously inconsistent.

One thing has struck me throughout the year, and that is the great dearth of geometers. What beating I have done for them has invariably met with but little success, the comparative scarcity of common species being even more marked than the absence of good ones. With the exception of great Jubilee festivity, when to display their patriotism *Noctuæ* swarmed to the feast for full three weeks or more, treacle has also been a total failure; but while the revelry lasted such numbers turned

up as I have never before seen equalled, excepting perhaps in the autumns of 1892 and 1893.

I had no opportunity of working the willows this year, but my cousin, Mr. W. J. Ogden, who was at Bournemouth at the end of March, met with little success. In an afternoon's trip from there to Brockenhurst he obtained larvæ of *Thera variata*, *T. firmata*, and *Ellopiæ fasciaria*, and an odd imago of *Xylocampa lithorhiza* from the pines, but neither *Trachea piniperda* nor larvæ of *Boarmia abietaria*. A number of *Xanthia* larvæ from a large willow all proved to be *silago*, while from the same bush in 1896 all the *Xanthias* taken were *cerago*. These latter had turned out a very nice lot, including both var. *flavescens* and some fine orange forms. Therefore, anticipating another variable series from the 1897 larvæ, I was disappointed at their all producing a strictly typical lot of *silago*. Both years a few *X. ferruginea* were mixed with the others.

At Waldringfield, in Suffolk (April 16th-26th), the same pine-feeding larvæ were again beaten, but far more backward than those from the New Forest; and from ash a fine lot of *Cirrhædia xerampelina* were obtained, some forty odd of various sizes. These were beaten after dark from the apparently bare twigs both of full-grown trees and hedgerow saplings, and fed up fairly well on the large buds until the latter broke into leaf; some died, but enough were left for a good series in September. Little else was taken here but a few *Lycæna argiolus*, and one *Trochilium apiformis* larva which was killed in getting out.

During May I did no collecting whatever, and very few things came to light around home.

I first tried treacling on June 4th at Chingford, and the result was only one single moth, but that a very fine *Cymatophora ocularis*, evidently just out, with the rose-blush fresh on the wings; a very few *Cidaria russata* and *Acidalia remutata* at dusk were all I saw besides, and things seemed very backward altogether. Two days later eleven *Xylophasia scolopacina* larvæ were found by searching the grass with a lantern at Highgate, where the species still lingers in the old Church Bottom Woods, although very locally even in that limited area. An odd specimen also of the moth turned up there at treacle in July.

Late in the afternoon of June 14th I ran down to Darenth, returning home by the 9.25 train from Greenhithe. Everything was still behindhand, and beating was most disappointing. I thrashed along all the hedges from Dartford to the wood, and hardly a moth of any sort did I disturb, the only one worth taking being a fresh *Phibalapteryx vitalbata*. In the wood itself things were almost as bad, and after two hours' hard work I had only boxed odd specimens of *Ephyra porata*, *Tephrosia extersaria*, *T. punctulata*, *Platypteryx falcula*, *Bapta temerata*, and *Lomaspilis marginata*. However, after dark lots of moths were flying along

the clematis-covered hedgerows, and over the champions in the fields. I had only a very short time before the train went, but among other things I took a fine lot of *Mamestra anceps*, some *Phibalapteryx tersata*, and *Neuria saponariæ*, the latter at blossoms of *Silene inflata*; such lots of things were on the wing that I regretted 9.25 being the last train home. Just as it was arriving I took a male *Arctia villica* flying round the lamp in the passage under the line, and on the same day I had another brought me from Southend, taken at a Sunday school treat.

Then came the Jubilee, which I took advantage of to get a couple of days at Hailsham, travelling down on Saturday afternoon, and returning on Monday evening to be ready for the procession on Tuesday, for which I had a seat. Hard beating through the woods during the daytime was very poorly repaid, but at long intervals *Halias prasinana*, *Eurymene dolabraria* (two only), *Asthena luteata*, *Acidalia subsericeata* (several), *Panagra chærophyllata* (common but local), and *Platypteryx falcata* turned up, but little else, and very few common things; while many regular Abbott's Wood species, such as *Melitæa athalia*, *Melanippe hastata*, *Gnophria rubricollis*, and others were totally absent. Very little was flying at dusk, and odd specimens of *Hepialus hectus*, *Halias prasinana*, *Calligenia miniata*, *Angerona prunaria*, *Cleora lichenaria*, *Acidalia subsericeata*, and *Timandra amatoria* were the best of a poor lot. Treacling was the feature of the visit, when common things swarmed to the tune of thirty, forty, fifty, or even more on every tree, with a fair sprinkling of better species. The best of the lot was *Diphthera orion*, but there was considerable variety, of which the following form the principal:—*Leucania comma* (very abundant and fine), *Xylophasia hepatica* (very common, often four or five on a tree at once), *X. rurea*, *X. anceps*, *X. lithoxylea*, *Apamea gemina* (six), *Miana strigilis*, *M. fasciuncula* (both in profusion), *Grammesia trilinea* and var. *bilinea* (two of the latter), *Rusina tenebrosa*, *Agrotis exclamationis* (in vast numbers and some nice forms), a single *Noctua plecta*, *N. festiva* (abundant and in great variety), *N. c-nigrum*, *Hecatera serena*, *Aplecta herbida* (fairly common, but some rather worn), *A. nebulosa* (abundant), a few each *Erastria fuscata*, *Hadena adusta*, *H. genistæ*, and *H. thalassina* (worn), and a fine variable series of *H. dentina*, from pale whitish grey to dark smoky black. I did no larva-beating, but in the hedges *Bombyx neustria*, *Diloba cæruleocephala*, and *Liparis auriflua* were very conspicuous, an odd full-grown larva of *Eriogaster lanestris* also turning up, but not any of the nests of the latter species.

I took very few species worth noting at Crouch End during the summer. *Apamea ophiogramma* occurred sparingly during July, and on the 10th of the same month I took *Acidalia imitatoria** on a gas-lamp, surely a curious species for a North London

* This species used to be fairly common at Mill Hill.—ED.

suburb. But it is strange how odd species turn up now and again; last year close to the same spot I took a fine *Anaitis plagiata*, also on a lamp. *Sesia tipuliformis* occurred on June 30th. Having no currant bushes now in our garden, I have not seen this species here for some eight or nine years, but formerly, when we had a garden with a lot of currant bushes, it was very common in company with *S. myopiformis*. Probably in old gardens both species still occur freely in North London.

While the treacling was still on, I had a most successful evening at Benfleet (July 1st), when, on my way to Southend, where I was staying the night, I met Mr. Whittle of that town. He had been in the reed-beds, but I had been treacling palings on the other side of the station. The palings were as full as the trees at Hailsham had been, and there was quite as large a variety, although very different species. The best insects boxed were some nice forms of *Agrotis exclamationis*, *A. corticea* (one male and three females), *A. suffusa*, *Leucania lithargyria*, *L. comma*, *L. straminea* (one only), *Mamestra anceps*, *M. albicolon* (one), *Mania maura*, *Hadena suasa* (a very fine and variable lot), *Aplecta advena* (one very good and one worn female, from which ova were obtained), and a fine fresh *Chaerocampa elpenor*. This is the first time I have heard of *elpenor* really settling down on treacle, although frequently netted flying round. *A. corticea* Mr. Whittle said he had never yet taken in the district, but I see he records a specimen taken on July 3rd, two nights after I met him. I again visited Benfleet on the 13th, but treacle was then going off. Very few moths turned up, and those were of the very commonest. On the slopes round Hadleigh Castle, in the afternoon, *Melanargia galatea* was common and just out, but had to be walked up owing to the absence of sun. Both *Hesperia linea* and *H. lineola* were in boundless profusion at the same place, the former far the commoner of the two; but, on the other hand, the few specimens taken at rest along the sea-wall in the evening were *lineola* without exception. At dusk several nice *Acidalia emarginata* were netted, and close to the station a fine *Lithosia complana* found at rest on the grass.

Treacle at Winchmore Hill on July 8th was a dead failure, and again at Darenth Wood on the 27th, when not a single Macro came to the trees. Curiously enough, however, I cleaned my brush on a head of ragwort, and, chancing to look at this later, boxed my only two Noctuae of the evening, viz. *Xylophasia scolopacina* and *Noctua baja*. Visions arose of a large bag had I only treacled ragwort-heads, but as the untreacted heads produced nothing, I went home with empty boxes, and had only the melancholy consolation of thinking what might have been. Another time when treacle is off, however, I shall certainly try sprinkling flower-heads. Scarcely anything flew at dusk, and beating along some three miles of hedge was as usual this year

most unprofitable work. *Gonepteryx rhamni* rather startled me by dashing out of a clump of clematis about 6 p.m., and at almost the next beat out came *Lycæna argiolus*. This is the second time I have come across the summer brood of this species around Darenth, the first time being July 27th, 1887, when they were very common near Greenhithe. Little else was disturbed, but a few *Melanippe subtristata*, four *Ligdia adustata*, and one *Iodis vernaria*.

The afternoon of July 31st I had planned out for Cuxton, but unfortunately the South-Eastern Railway Company had made other arrangements, and I arrived just in time to get tea and return, after spending one hour and three quarters on Gravesend platform by the way; so I only beat a few hedges around by the station, boxing one *Larentia olivata*. It was rather foolish being caught a second time on Bank Holiday Saturday, as I was landed in a similar way at Redhill the previous year, and by the same railway company.

Part of August I spent on the Yorkshire coast, but did no collecting, except on one day (the 16th), when I took a long walk over the moors behind Whitby. In the wooded hollows *Cidaria immanata*, *Hypsipetes elutata*, and *Larentia didymata* were very abundant, and *Polia chi* was dotted about conspicuously on the stone walls. From the heather I picked odd larvæ of *Bombyx quercus* var. *callunæ* and *Arctia fuliginosa*, whilst on some stunted shallows almost at the top of the moors to my surprise I came across three full-fed larvæ of *Dicranura vinula*, and a large brood of *Phalera bucephala*, the latter about an inch long. Is not this a strange situation for these species? Also up on the moor a single *Argynnis aglaia* and several *Plusia gamma* and *Charæas graminis* were seen on the wing.

At Crouch End again in September *Hydræcia micacea* turned up at light on the 1st, and *Luperina testacea* was abundant throughout the month. Three *Hepialus sylvanus* males put in an appearance all together at our front-door lamp on the 3rd, these being all I have ever seen of the species here, with the exception of one female three years ago. *Catocala nupta* occurred on the 9th, and again on the 14th, and an odd larva of *Acronycta aceris* on the 8th.

My last evening's collecting was on the 8th, down at Winchmore Hill, when only about fifteen moths came to some eighty or ninety treacled trees; these included three *Catocala nupta*, two *Asphalia diluta*, and single specimens each of *Noctua c-nigrum*, *Caradrina alsines*, *Amphipyra pyramidea*, and *Anhocelis lunosa*; and thus my year's collecting ended.

However, I received some more things from my cousin, who was down at Waldringfield during September, where he found treacle a dead failure, taking nothing better than *Agriopis aprilina* and *Hypena rostralis*, as the result of many nights' work.

Some consolation was got by the reappearance of *Sphinx convolvuli*, which had occurred there not uncommonly in 1895. Some four or five specimens were seen over the *Nicotiana* on various nights during the month, and two of them were taken, one of these being an exceedingly large female.

Larva-beating was fairly good on the whole, and the best species thus taken were *Geometra papilionaria*, *Amphidasys betularia*, *Hypsipetes impluviata*, *Platypteryx hamula*, *Ptilodontis palpina*, *Notodonta dromedarius*, *Halias prasinana*, and an imago of *Xanthia gilvago*, which was in vain kept for ova. Two *Cymatophora ocularis*, a number of *Axylia putris*, and a few *Agriopis aprilina* were the best pupæ dug, both the *ocularis* coming from oak. The several pupæ of this species that my cousin has obtained at Waldringfield in previous years have all come from under oak, none from poplar.

Autumn treacling I have had no opportunity of trying, but as on all hands I hear it to have been most unsuccessful, I may have only avoided adding another failure to a year's collecting which, with a few exceptions, has been rather a disappointing one.

I might add that the brood of *Aplecta advena* obtained from the Benfleet specimen is just now emerging, the specimens being small and poorly coloured, probably owing to the difficulty of feeding the larvæ up so late in the autumn, although at the time they seemed to feed well enough.

3, Mount View Road, Crouch End, N., Feb. 19th, 1898.

A CATALOGUE OF THE LEPIDOPTERA OF IRELAND.

By W. F. DE VISMES KANE, M.A., M.R.I.A., F.E.S.

(Continued from p. 12.)

MELANIPPE MONTANATA, *Bork.*—Common everywhere. The Irish insect is of large size usually, and a considerable proportion of them belong to or approach the var. *shetlandica*, Weir, being strongly marked in pattern, with the outer margins of all wings deeply shaded with fuscous bands. Two Scandinavian examples which I possess are similarly characterised, so that it seems probable that this is a northern peculiarity. Some Irish localities, such as the shores of Lake Oughter near Farnham, produce a very handsome form, in which the transverse central band of the fore wings is beautifully waved with ferruginous, with a central shading of bluish grey, often showing round the discoidal spot, which is upon a white costal patch. The bluish tinge fades in the cabinet. The markings, however, in this species are extremely variable. The transverse band is sometimes blackish, sometimes an almost unicolorous ferruginous,

without any included costal patch. Sometimes the band is very obsolete, only its edges being strongly marked. Occasionally it is narrow, and deeply constricted towards the inner margin, so as almost to divide the band in two. In some specimens the waved strigæ in the middle of the band coalesce, so as to form a series of two or three ocelli below the black central spot. The central band of the hind wings varies in strength, being occasionally absent, except traces at the inner margin.

MELANIPPE GALIATA, *Hb.*—Somewhat local, except on the coast, where it is often extremely plentiful. It varies chiefly in the colour of the transverse band of the fore wing, which is either grey marked with faint waved strigæ, or grey centrally edged with brown bands; or else wholly black, sometimes obliterating the central spot.

MELANIPPE FLUCTUATA, *L.*—Here as elsewhere one of our commonest Geometers. I know of no variation which is not present in Great Britain, and of none that prevails to such an extent as to be characteristic of our fauna.

ANTICLEA CUCULLATA, *Hufn.*—The only Irish example I have seen is a beautiful specimen taken by myself from the wall at Glenina Castle, Ballyvaughan, Co. Clare. Another was captured, I believe, by Curzon at Ardahan, a bare limestone district of similar character about twelve miles distant in the Co. Galway.

ANTICLEA BADIATA, *Hb.*—Of frequent occurrence throughout Ireland. Numerous at Drumreask Monaghan, Galway, and many other localities I have visited. It varies much. A very dark form sometimes occurs with the pale central band very bright and narrow. On the other hand, very unicolorous specimens occur, with only the basal strigæ and the costal portion of the dark band which usually bounds the outer edge of the pale band when present, thus closely approximating the markings of *A. rubidata*. The insect is everywhere distributed in varying abundance.

ANTICLEA NIGROFASCIARIA, *Göze.*—Not unusual, but local, and far rarer than the preceding. It varies somewhat in the width of the outer basal black band, as well as in the depth of the ground colour of the base, and the shaded areas near the apical and anal angles of the fore wing. "Common in Wicklow" (*B.*), Roebuck (*Mr. Hogan*), and Phoenix Park (Rathborne) near Dublin; Ardully, Co. Kerry (*Miss V.*); Clonbrock (*R. E. D.*); Tempo Manor (*Langham*), and Enniskillen; Killynon, not scarce (*Miss R.*); Westmeath; Drumreask, Co. Monaghan; Favour Royal, Co. Tyrone; Armagh (*J.*); Collin Glen, Belfast (*W.*); Castle Bellingham, not rare (*Thornhill*).

COREMIA MUNITATA, *Hb.*—Local and not usually plentiful, but widely distributed. Dark forms occur near Derry and Banagher, in which the central band of the fore wing is of dark fuscous brown, with the margins suffused internally into the ground colour. I have seen no approach to the ruddy Shetland form. Belfast (*Bw.*); Slieve Croob, Co. Down (*W.*); near Derry, locally numerous (*C.*); Drumreask Monaghan; Favour Royal and Altadiawan, Co. Tyrone; Cromlyn (*Mrs. B.*) and Killynon (*Miss R.*), Westmeath; near Sligo (*Russ.*); Toberdaly and near Banagher on the Shannon, King's Co.; Clonbrock (*R. E. D.*) and Ballinasloe, Co. Galway.

COREMIA DESIGNATA, *Hufn.*—Widely distributed, but somewhat local. The central band varies extremely, sometimes being proportionately as broad as that of *C. munitata*, and the edges only slightly more strongly margined with black; while others have merely a black blotch at the costa narrowing off to a broad line at the inner margin. Many have a rich purplish tinge on the central portion of the band, in others it does not differ from the rest of the wing in colour. In some, too, the black margins of the band coalesce toward the costa, enclosing a ruddy patch. I have noticed an abundant emergence of the second flight in the Co. Galway, and at Mote Park, Rosecommon, about the third week of August. Abundant at Powerscourt (*B.*) and Glenchree, Co. Wicklow; Howth, Co. Dublin; Killarney and Kenmare; Clonbrook, abundant, and Ardahan, Co. Galway; Mote Park, Co. Rosecommon; Hollybrook, near Boyle; Favour Royal and Altadiawan, Co. Tyrone; Tollymore Park, Co. Down (*W.*).

COREMIA FERRUGATA, *Clerck (?) L.*—In dealing with this and the following species I shall follow the careful paper of Mr. Louis B. Prout, read before the Entomological Society of London, March, 1894. This moth has a wide distribution in Ireland, but is somewhat localized. On dry slopes and banks on the edges of moors or hilly wastes it sometimes is extremely abundant. Of the varieties dealt with by Mr. Prout I have never seen the really black-banded form, though occasionally specimens with a broad dark purple band occur, like that of *C. unidentaria*. The Irish insect shows a distinctly Northern facies. For although the non-striated broad-banded forms of the South of England are represented, yet the general run are more distinctly barred with strigæ, and are more tinted with ochreous. But in several localities a strongly striated form occurs, with a very ochreous ground colour, the central band sometimes broken up with dark streaks. The extreme of this form is represented by a specimen from Tyrone, approximating closely (except in the ground colour being ochreous, and the strigæ not so sharply defined) to a Scandinavian example labelled by Sven Lampa var. *corculata*,

which has a grey ground with two basal strigæ, and the middle band indicated by two waved dark lines inside, and three outside the discoidal spot; the apical angle and outer margin shaded with fuscous brown. I notice that Mr. Prout gives *ab. corculata*, Lampa, as a synonym of the type. It would, however, appear that this is an error. Another Scandinavian example is the ordinary broad-banded type, but less ruddy than the English. Mr. Prout notices that the striated form occurs only as an aberration in England, though here it is distinctly local at Altadiawan in Tyrone, where Mr. M. Fitzgibbon took a good series in my company, also in places in Monaghan, Westmeath, and Sligo. It is variable, however, within limits, and I cannot say if it is referable to var. *salicaria*, Haw., which Mr. Prout appears to think may have been an extreme striated form of the Rannoch type. He considers some of the Irish forms referable to var. *linareata*, Gn. As to the character of the middle band, which is in some cases broad at the costa and narrowed towards the inner margin, the inconstancy of the species precludes the possibility of defining a variety from this alone, as every gradation occurs, short of the form *coarctata*, Warren, in which the attenuation is extreme, and which I have never met with. Borkhausen's *spadicaria* occurs with us. A very fuscous example, perhaps similar to the one 555 figured by Wood (of which I have here no copy), was taken by me at Favour Royal. The fore wings are almost a unicolorous fuscous brown, with the broad band and twin spots hardly to be distinguished. The hind wings also are very dark. I am of opinion that this species is more frequently met with in Ireland than the following. Kippure Mt., Co. Wicklow; Cappagh, Co. Waterford; Kenmare and Killarney; Clonbrock, Merlin Park, and elsewhere in Galway, not rare; near Sligo; Killynon, Co. Westmeath; Farnham, Cavan; Drumreask, Monaghan; Favour Royal and Altadiawan, Co. Tyrone, plentiful; Armagh, and the shores of L. Neagh (*J.*); Enniskillen (*A.*) and Tempo Manor (*Langham*); Castle Bellingham (*Thornhill*), &c.

COREMIA UNIDENTARIA, Haw.—Both the black- and purple-banded forms occur, and I have found them in the same locality at Altadiawan, Tyrone, Enniskillen (*A.*), Tempo Manor, Castle Bellingham, and Ardtully, Co. Kerry. Other localities are Armagh (*J.*); Clonbrock (purple-band), Co. Galway; Killarney, do.; Donegal, do.; Cappagh, Co. Waterford (black).

(To be continued.)

TWO NEW SCALE INSECTS.

By T. D. A. COCKERELL.

Lecanium perlatum, n. sp.

Female scales on under side of leaf, broad and flat, much like *L. tessellatum*; chestnut colour, smooth and shiny, surface malleate, form oblique, 7 mm. long, 7 mm. broad. Legs extremely small, about the size of those of *L. hesperidum*, of ordinary form, trochanter with a long bristle, femur only moderately stout, tibia about three-quarters the length of femur, tarsus about half as long as tibia, claw short and stout, its digitules extending considerably beyond its tip. Antennæ 8-jointed, formula approximately (23) (45) (16) (78), 4 and 5 are not much shorter than 3, 1 with a short hair, 5 with a long hair, 6, 7, and 8 each with a lateral hair (8 with two), and 8 with three terminal hairs, one very long. Dermis brown, with large oval and round glands, not reticulated. Hairs of margin extremely small and few in number. Stigmatal spines in threes, two small and one large.

Hab. Ponta Delgada, Azores; on orange trees. (Div. Ent. U.S. Dep. Agr., No. 7312.)

L. perlatum is a very distinct and interesting species. It was sent to me for study by Dr. L. O. Howard, to whom I transmitted a description. Dr. Howard informs me that he forwarded the MS. to Prof. Chaves in the Azores, who will publish it there; but for the convenience of students it is deemed wise to send a copy to a widely-read entomological journal.

Aspidiotus juglans-regiæ var. *kafkæ*, n. var.

Mr. Karl L. Kafka sends me an apparently new form of *Aspidiotus*, found on bark of *Fraxinus excelsior* in Vienna. Curiously, it approaches our American *A. juglans-regiæ*, Comst., so much so, that I propose to call it *A. juglans-regiæ* var. *kafkæ*, new var. The female scale is circular, $2\frac{1}{2}$ mm. diam., flat, very dark grey or blackish, exactly the colour of the bark; exuviae subcentral or sublateral, covered, orange-reddish. Removed from the bark the scale leaves a white mark. Male scale small and elongate, about twice as long as broad. Female insect like *juglans-regiæ*, but glandular thickening at inner base of median lobes larger than or as large as that at outer base; the rounded orifice, which in *juglans-regiæ* is close to thickening of outer base, is in *kafkæ* beneath or just laterad of thickening of inner base; the median lobes in *kafkæ* are a little further apart, and hardly so produced as in *juglans-regiæ*. Five groups of ventral glands, median 2 or only one, caudo-laterals 9, cephalo-laterals 10. First row of transversely oval glands, starting at the de-

pression laterad of the second lobe, of 6 orifices; second row of 12; third row of 12; fourth row of 5 or 6; an inner row, starting beneath the interlobular interval, is, excepting the first two, only represented by a few very small and rudimentary orifices.

Mesilla Park, New Mexico, U.S.A., Jan. 4th, 1898.

NOTES AND OBSERVATIONS.

INTERNATIONAL CONGRESS OF ZOOLOGY.—We have received various notices and lists of committees relating to the above; also the following:—"Memorandum.—At the Meeting of the International Congress of Zoology at Leyden in 1895, it was agreed that the Fourth Congress should be held in Great Britain, and that the President should be Sir William Flower, K.C.B., F.R.S. Some time since the Permanent Committee of the Congress accepted an invitation to assemble at Cambridge, in August, 1898. At a General Meeting of British Zoologists, invited by Sir W. Flower to confer as to the best means of making this Congress a success, it was announced to our great regret that the state of the elected President's health made it imperative for him to resign. It was proposed that his place should be taken by the Right Hon. Sir John Lubbock, Bart., and this proposal has met with the unanimous approval of the Permanent Committee of the Congress.—JOHN LUBBOCK, *President*." Further particulars may be obtained from Professor F. Jeffrey Bell, 3, Hanover Square, London, W.

TWO ABERRATIONS OF *LYCÆNA (POLYOMMATUS) ÆGON*.—(1). A fine and fully scaled female example captured by me on Dunyeats Hill, near Poole, in June, 1898 (the exact day I have unfortunately lost), differs from the typical form in the following particulars:—The usual brown pigment of all the wings is absent from a space triangular in shape; on the fore wings the base of the triangle extends from the anterior angle to the third median nervule, and the apex reaches to the discoidal spot; within this space all the usual orange marks are absent. On the hind wings the base of the triangle extends from the second median nervule to the second subcostal nervule, and the apex of the triangle reaches the discoidal spot. The usual orange marks are very bleached, though not absent. (2). The row of spots in the outer marginal cells of the fore wings have a tendency to coalesce and extend towards the base of the wings. This specimen was captured at the same time and place as the last-described insect. It is slightly damaged.—W. PARKINSON CURTIS.

EPIONE PARALLELARIA IN SCOTLAND.—It may be interesting to know that in a collection of local Lepidoptera temporarily formed by the members of the South of Scotland Entomological and Natural History Society from their cabinets, and exhibited at an entomological exhibition held by them in 1895 at Galashiels, *Epione parallelaria* (*vespertina*) was represented by two fine specimens.

THE RHOPALOCERA OF BIRMINGHAM AND DISTRICT.—With reference to my note on the above (*ante*, p. 42), I find that I have accidentally omitted *Vanessa c-album* from that list. It is generally distributed, and was much more frequent than at present. The examples that I have taken are chiefly of the pale form. It is sometimes seen in suburban gardens.—AUGUSTUS D. IMMS; "Linthurst," Oxford Road, Moseley, February 4th, 1898.

SPHINX CONVULVULI LARVÆ IN WINTER CONFINEMENT.—The larvæ referred to were hatched from a batch of thirty eggs deposited by a moth on Sept. 14th, 1897, which I recorded (*Entom.* xxx. p. 270). It being late in the year, it was necessary to retard the hatching of these ova if possible, so they were placed away in a cold room. Seven days later (Sept. 21st), on looking into the box, it was found that thirteen larvæ had already emerged; they were then about three-sixteenths of an inch long. *Convolvulus arvensis* was supplied to the larvæ, which they readily ate. A peculiarity which I have not before noticed was that they spun long webs over their food. On Oct. 14th the first moult took place, and this resulted in the death of four. They now resembled their congener *S. ligustri** in miniature, only the stripes were very much paler. The second moult occurred on Oct. 27th. The pale green was now replaced by a variegated brown, culminating into black, the lateral markings being a creamy white, the spiracles a light red, and each segment having a light yellow spot, with the exception of the first, second, and last, which had them concurrent. The anal horn (previously black) now had a white streak on each side. This change claimed three more, leaving only six living larvæ. Nov. 8th, third moult, followed by a day of inertia. Up to this time the larvæ had been feeding well on both *C. arvensis* and *C. soldanella*, but there was much difficulty in procuring these plants now, as they were mostly over, so the local florist had orders to force the seeds of both these bindweeds. A most trying time had come, both to the breeder and larvæ, as they now measured three and a quarter inches, and of course required more food. I must not omit to state, after this moult they varied much in colour; the usual brown type was much darker, whilst one was a rich black, whereas several might be considered like that depicted by Barrett. Eventually the forced seedlings arrived, they (the larvæ) having been without food for nearly twenty-four hours. On placing their food before them, they nibbled off the green leaves, never stopping until they had devoured the juicy stalks to the root. *C. affinis* they would not touch; but, strange to relate, endive, when offered them, they would instantly clasp and devour. I tried this vegetable through mention being made of it by Mr. Lucas in his book on the Sphingidæ. The same gentleman, in a letter to me (Sept. 22nd), rather despaired as to the possibility of success in rearing this insect. December being more unpropitious than the other months made the larvæ (now full-grown) more susceptible to its changes; the result being that two more

* *Ligustri* is not now regarded as congeneric with *convolvuli*. The former is the type of *Sphinx*, Linn., and the latter of *Protoparce*, Burm. Kirby, however (*Cat. Lep. Het.*), sinks *Protoparce* in *Phlegethontius*, Hüb., of which he indicates the type to be *sexta*, Joh.—ED.

succumbed on the 12th and 14th. On the former date two went under the earth in a flower-pot, leaving two, both having ceased to eat and roam about. These eventually turned in on the 16th, without having completed their fourth moult, it having required exactly eighty-six days from the hatching to the commencement of pupation. I unearthed the first two cocoons Dec. 18th; one was so thin that it fell to pieces on touching it, the other was very thick, like that of *Acherontia atropos* but not so large. This contained a lively pupa, which could only have taken this form a few hours. A day or two afterwards I looked at the other two, and found they had burrowed only two inches, where they remained dead, and without having attempted to make cocoons. Mr. W. Henry Barton, who acknowledges that the game is not worth the candle, can claim to have surmounted the difficulty. Although successful, he is only awarded a small average of one-eighth per cent.—H. W. BELL-MARLEY; Ravenscourt Park.

[The following excerpt from "Abstract of Proceedings of the South London Entomological and Natural History Society," 1896, p. 29, may be of interest in connection with the above:—"Mr. Sturt exhibited specimens of *Sphinx convolvuli* which he had bred in December and January from the larvæ sent him from Cornwall (Proc. 1895, p. 57). Mr. Tutt remarked that Mr. Sturt deserved great credit for getting his *S. convolvuli* through, and he was, he believed, the first British lepidopterist who had reared the insect from the larva to the imago. Some years ago Prof. Poulton got the larva through to the late autumn, and proved that the insect passed the winter in that stage. . . . Mr. McArthur said that men who worked in potato fields often brought in the pupæ of *S. convolvuli*, as well as those of *A. atropos*."—ED.]

PORTHETRIA (OCNERIA) DISPAR IN AMERICA.—From the latest report of the State Entomologist concerning the extermination of the gipsy moth (*Porthetria dispar*) in Massachusetts (Bull. No. 11), we learn that something in the way of a check has been effected. The cost up to the present time has been nearly 800,000 dols. It would appear, however, that unless a further large sum is available for continued operations during the next few years, and without any interval, all the work that has been done during the past six years will be lost.

GYNANDROMORPHOUS HEMEROPHILA ABRUPTARIA.—At a meeting of the Entomological Society of London held on February 2nd last a specimen of *H. abruptaria* was exhibited which was female in character so far as concerns the wings and right antenna; the left antenna, however, was strongly pectinated. Several dark examples of the same species were also shown.

THE GENUS EREBIA.—We are requested to state that the specimens of the genus *Erebia* exhibited by Mr. H. J. Elwes, F.R.S., in illustration of his remarks at the last meeting of the Entomological Society of London will, by arrangement with Sir William Flower, Director of the British Museum (Natural History), be on view at that institution for a few weeks. The series contains, almost without exception, representatives of all the known species and more prominent varieties,

and should be seen by all students of this difficult and interesting genus.

ENTOMOLOGY IN TIRAH.—Though for some years I have ceased to covet butterflies, they still have a keen interest, and I thought that as probably no one else was interested much in entomology in Tirah, where I have lately been, perhaps these very scanty notes may be of use from a hitherto unvisited country. General elevation of Maidan about 5000 ft. A plateau, intersected by numerous ravines, surrounded by hills up to about 12,000 ft. Trees: pine, walnut, apricot, apple, pear, and others a few. On November 2nd an Indian variety of our little "Queen of Spain" was common on the Sampagha Pass, a little faded; possibly *Argynnis issa*. In the same place, and frequently in Maidan itself, a fine grayling *Aulocera* (? possibly) was seen wherever the barren ground they frequent was present. In Maidan a clouded yellow of rich colour was fairly common; and less seldom another species of *Colias*, or a variety corresponding to *Colias edusa* var. *helice*, was seen, but I did not get an opportunity of seeing one settled. The clouded yellow was possibly *C. fieldii*. A few of a *Pieris*, I believe *mesentina*, and occasionally a smart small copper something like *Chrysophanus pavana*, but apparently ruddier. I make no pretence of identifying those I saw or of having noted much, as one was nearly invariably under fire when out from camp, the inhabitants being hostile to entomology or any other pursuit in their country, and I should not venture to offer these if I thought any one else had made any entomological notes. I send you a pupa from Maidan, which, if it hatches, will probably be the first specimen from Tirah.—K. DINGWALL; 1st Gordon Highlanders, 3rd Brigade, Tirah Field Force, December 31st, 1897.

[We have great pleasure in publishing the above communication. The pupa referred to has not come to hand unfortunately.—ED.]

PYRAMEIS CARYE VAR. MUELLERI.—Mr. Beverly Letcher, of San Francisco, describes an aberration of *P. carye* as var. *muelleri* in the February number of 'Entomological News' (ix. p. 38, pl. iii.). Of this aberration, which in some respects is similar to *P. cardui* var. *inornata*, Brams., only eight examples are known, one of which was taken by Mr. Letcher in 1892, and another in 1897.

THE RAGONOT COLLECTION OF MICRO-LEPIDOPTERA.—We understand that this collection has been presented to the Paris Natural History Museum by Madame Ragonot.

EXPERIMENTAL TREATMENT OF ARASCHNIA LEVANA, L.—In a paper entitled "Die Uebergänge von *Araschnia levana*, L., zu var. *prossa*, L., und die bei der Zucht anzuwendende Kältemenge" ('Entomologische Nachrichten,' xxiv. pp. 37-52), Herr G. Wilh. Ruhmer, gives a detailed account of the results obtained in a series of temperature experiments with this species.

NATURÆ NOVITATES.—We have received from Friedlander & Sohn, of Berlin, the first number of a periodical bearing this title, which it is proposed to issue every fortnight at a small subscription. The

purpose of the publication is to keep the student of natural history or of the exact sciences up to date in the matter of the current literature of all countries. In the present number there are 1537 entries, and eighty of these relate to entomology.

CAPTURES AND FIELD REPORTS.

MACROGLOSSA STELLATARUM IN JANUARY.—As an instance of the extraordinary mildness of the season at the present time, on Monday, Jan. 31st, I noticed a specimen of *Macroglossa stellatarum* on the wing. It was flying along some palings in a sheltered spot, occasionally alighting and basking in the sunshine.—T. B. JEFFERYS; Bath, Feb. 2nd, 1898.

NOTES FROM NORTH STAFFORDSHIRE IN 1897.—Collecting here in the spring during the past season was very unproductive up to the beginning of June, no doubt owing to the prevalence of cold winds. Sugar, also, was almost useless; many times in July and August, when the nights were warm and cloudy, it was an absolute failure, hardly an insect visiting the trees.

During February *Dianthæcia capsicola* and *Halias prasinana* emerged in the breeding-cage. March.—*Anisopteryx æscularia* and *Dicranura vinula* (bred). April.—Nothing of importance was observed. May.—*Tephrosia crepuscularia*, *Cidaria suffumata* (common), *Euplexia lucipara*, &c. June.—*Cænonympha pamphilus*, *Anthocharis cardamines*, *Pieris napi*, *Sesia tipuliformis*, *Rumia cratægata*, *Asthena candidata*, *Eupisteria heparata*, *Cabera pusaria*, *Fidonia atomaria*, *Abraaxas grossulariata*, *A. ulmata*, *Lomaspilis marginata*, *Larentia pectinataria*, *Melanippe tristata* (very abundant), *M. montanata*, *M. fluctuata*, *Eubolia palumbaria*, *Anaitis plagiata*, *Notodonta camelina*. On June 26th *Acronycta leporina* was taken at rest on a birch-tree (at roots of same tree in February, 1896, a pupa of *Notodonta dictæoides* was taken), *Miana fasciuncula*, &c. July.—*Argynnis selene*, *Uropteryx sambucata*, *Metrocampe margaritata*, *Crocallis elinguaris*, *Boarmia rhomboidaria*, *Acidalia remutata*, *Halia vaularia*, *Larentia didymata*, *Hypsipetes elutata* (very common and variable), *Coremia nunitata*, *C. propugnata*, *Thyatira batis*, *Apamea oclea*, *Agrotis exclamationis*, *Plusia festuæ* (two specimens reared from larvæ taken in June). On Aug. 23rd *Oporabia filigrammaria* was fairly common on the moors, together with *Larentia cæsiata* and *L. didymata*, the latter in hundreds. *Camptogramma bilineata*, *Cidaria russata*, *C. immanata*, *C. testata*, *C. populata*, *C. fulvata*, *C. pyraliata*, *Eubolia mensuraria*, *Xylophasia scolopacina* (was netted at dusk on Aug. 9th), *Luperina testacea*, *Cloantha solidaginis* (was common on the moors, resting on pine-trunks and walls, and as it rests with its wings folded round its body it presents a very curious appearance, and is difficult to see). September.—*Thera variata*, *Anchocelis rufina*, *A. litura*, *Xanthia silago*, *Miselia oxyacanthæ*, *Agriopis aprilina*, *Phlogophora neticulosa*, *Amphipyra tragopogonis*. October.—*Oporabia dilutata*, *Xanthia ferruginea*. November.—*Pæcilocampa populi* (bred from pupa found at roots of ash in September).—J. & W. HILL; 7, Westwood Grove, Leek, Staffs., Feb. 10th, 1898.

CARADRINA AMBIGUA AT TRURO.—I spent part of last August in the neighbourhood of Truro and took some *Caradrinæ* at sugar, which have

turned out to be *C. ambigua*. Is not this a new locality?—GEORGE C. HART; Woodside, Howth, Co. Dublin, Feb. 1st, 1898.

[This species was recorded as "somewhat common" in Devon last year (Entom. xxx. 305), and specimens are mentioned from South Devon in the same volume, p. 327.—ED.]

PIERIS RAPÆ IN EARLY JANUARY.—Jan. 7th was a bright sunny day—quite spring-like. When out for a walk I found a male *P. rapæ*, alive, but sluggish. Whether it had just emerged from pupa or not I cannot say. I could find no empty pupa-shell anywhere near. It lived in a butterfly vivarium out in my garden for about a fortnight, but a frosty night was fatal to it just when I had begun to speculate on this butterfly passing the winter in a torpid state, at least when the cold was not too severe.—ALBERT H. WATERS, B.A.; Devonshire Road, Cambridge, Feb. 10th.

LIGHT-TRAPS IN 1897.—The past season, bad in every respect, was much below the average for light-traps. Early in the season the winter moths occurred in much the same numbers as usual, though *Hybernia leucophaæaria* and *Anisopteryx æscularia* were rather scarce. Later on *Nyssia hispidaria* was fairly common, *Tæniocampæ* all scarce, as were also the two *Tephrosias*, *bistortata* and *biundularia*, though the second brood of the former occurred plentifully in July. The *Boarmias* were scarce, and hardly any var. *conversaria* were taken; *Aventia flexula* almost absent, and *Cleora glabraria* entirely so. The autumn work was disastrous, *Astero-scopus sphinx* occurring in far less numbers than usual, and in poor condition. From October to December *Pæcilocampa populi* occurred in profusion, and was quite the moth of the year.

The following are additional records for the trap:—*Thecla quercus* (*Vanessa atalanta* also occurred for the second time), *Lithosia griseola*, *Nemeophila russula* (male and female), *Neuria reticulata*, *Triphæna comes*, *Dianthæcia cucubali*, *Phytometra viridaria*, *Gnophos obscuraria*, *Abraaxas sylvata*, *Ligdia adustata*, *Eupithecia subfulvata*, *Aglossa pinguinalis*, *Scoparia cratagella*, *Nomophora noctuella*, *Ebulea crocealis*, *Perinephele lancealis*, *Spilonota roborana*, *Sciaphila chrysanthæana*, *Batodes angustiorana*, *Pædisca corticana*, *P. solandriana*, *Scardia arcella*, *Depressaria arcuella*.—E. F. STUDD; Oxtou, Exeter.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—February 2nd, 1898. Mr. G. H. Verrall, Vice-President, in the chair. Mr. L. C. Chawner, of Forest Bank, Lyndhurst; Mr. F. A. Heron, B.A., of the British Museum (Natural History); Mr. Henry Stebbing, of The Shawe, Jarvis Brook, Tunbridge Wells; and Mr. E. J. Burgess-Sopp, of Saxholme, Hoylelake, Cheshire, were elected Fellows of the Society. A letter was read from the Secretaries of the International Congress of Zoology, calling attention to the meeting to be commenced at Cambridge on August 23rd, and extending to the Fellows of the Society the cordial invitation of the Executive Committee to be present. The Secretary also read a letter from Mr. A. D. Michael, of 9, Cadogan Mansions, S.W., asking if any entomologists, who might

find insects attacked by mites (*Acari*) among their disused boxes, would be willing to send him such insects, with the mites still on them or accompanying them, or at least the mites themselves, with the name of the insect given in all cases, for the purpose of his forthcoming monograph of the Tyroglyphidæ. Mr. J. W. Tutt showed a fine series of forms of *Hemerophila abruptaria*, Thunb., captured and bred by Mr. W. S. Pearce at Holloway, varying from the normal colour, through mahogany-brown to dark fuscous, some of the specimens of the second brood showing a purplish hue. One gynandromorphous example was shown, with the wings and right antenna of the female type, the left antenna being strongly pectinated. He also exhibited two specimens of *Dianthæcia luteago*, bred by the Rev. F. Lowe, from larvæ obtained in Guernsey, and of a very distinct character, having a tendency to the ochreous coloration of the type-form, but being differently marked. On behalf of Mr. Heyne, Mr. Jacoby exhibited a series of temperature-varieties of Lepidoptera. Mr. G. H. Carpenter read a paper by himself and the Rev. W. F. Johnson on "The Larva of *Pelophila borealis*," describing its structure and life-history. On the larval characters the species, hitherto considered as of doubtful relationship, was regarded as being closely allied to *Elaphrus*. Papers were communicated by Mr. F. D. Godman, F.R.S., and Mr. O. Salvin, F.R.S., on "New Species of American Rhopalocera," and by Mr. M. Jacoby, "On Some Phytophagous Coleoptera (Eumolpidæ) from the Islands of Mauritius and Réunion."

February 16th.—Mr. G. H. Verrall, Vice-President, in the chair. Mr. G. C. Champion exhibited specimens of *Isodermus gayi*, Spin., from the Straits of Magellan, and *I. planus*, Er., from Tasmania, both found by Mr. J. J. Walker. The genus *Isoderma*, belonging to the Aradidæ, afforded an interesting case of geographical distribution, the only known species occurring in Chili, Australia, and Tasmania. Mr. C. O. Waterhouse referred to the similar distribution of other species of insects, which went to support the theory of a former connection between South America and Australia. Mr. Champion also showed an example of *Bagous lutosus*, Gyll., from Sweden. This insect had been on the British list since the time of Stephens, but possibly in error, as all the examples he had seen in collections were wrongly so named. Mr. Jacoby exhibited a pair of the singular weevil, *Apoderus tenuissimus*, Pasc., from the Philippines. Mr. Burr exhibited species of Orthoptera, of the family Eumastacidæ, resembling dead leaves. This was the only family of Acrydiidæ in which such resemblances were found. Dr. Chapman exhibited a specimen of *Zygana exulans* with six wings, the supernumerary pair arising between the normal left fore wing and the corresponding leg on the same side. The uppermost wing appeared normal in every respect, the second was a reduced copy of the basal half of a fore wing, and the third a portion of crumpled wing-structure. Mr. O. E. Janson exhibited a pale variety of the rare *Papilio mikado* taken in S. Japan. Mr. Tutt showed a variety of *Enodia hyperanthus* taken by Mr. F. H. Day near Carlisle, and banded on the under side like a *Canonympha*; also two moths from the same neighbourhood, which, after careful comparison, he regarded as females of *Hydrilla palustris*. This sex was almost or quite undiscovered in Great Britain, and the occurrence of the species

so far from the Fen district was remarkable. Mr. H. J. Elwes read a paper entitled "A Further Revision of the Genus *Erebia*," which was illustrated by the exhibition of examples of every known species. Tracing the geographical distribution, he stated that the principal European centres of the genus were the Pyrenees, and especially the Alps, only a few forms occurring in Scandinavia, while the Ural Mountains and Caucasus were almost destitute of species. The genus became abundant in E. Siberia, from which region the few N. American forms appeared to have been derived. Dr. Chapman also read a paper "On the Species of the Genus *Erebia*, a Revision based on the male Appendages," illustrated with drawings of these organs in about sixty species. In connection with the above papers Mr. Tutt exhibited and made remarks on long series of *Erebia nerine*, *E. glacialis*, *E. euryale*, *E. ligea*, &c., chiefly from the Alps.—W. F. H. BLANDFORD, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*January 13th, 1898.*—Mr. R. Adkin, F.E.S., President, in the chair. Mr. Adkin exhibited minor varieties of *Pararge megera*, and contributed notes thereon. Mr. W. G. Pearce brought a series of very dark *Hemerophila abruptaria*, bred from ova laid by a female captured in North London. The Secretary read a paper communicated by Professor A. Radcliffe Grote, A.M., entitled "The Wing and Larval Characters of the Emperor Moths," and exhibited the following species in illustration:—*Saturnia pavonia*, *Agria tau*, *Automeris io*, *Hemileuca maia*, *Citheronia imperialis*, and *Attacus speculifer*, kindly lent by Mr. C. G. Barrett.

January 27th, Annual Meeting.—The President in the chair. Reports of the satisfactory condition of the Society were read from the Council and Treasurer. The balance in the Treasurer's Report was somewhat smaller than usual, owing to the first part of the 1897 Proceedings being printed in the current year. The following Officers and Council were then elected:—President, J. W. Tutt, F.E.S.; Vice-Presidents, R. Adkin, F.E.S., and W. Mansbridge, F.E.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, H. A. Sauzé; Curator, W. West; Hon. Secretaries, Stanley Edwards, F.L.S., and H. J. Turner, F.E.S.; Council, T. A. Chapman, M.D., F.E.S., F. Clark, A. W. Dennis, A. Harrison, F.E.S., F.C.S., W. J. Lucas, B.A., R. South, F.E.S., and H. Tunaley, F.E.S. In his address the retiring President dealt at length with matters concerning the well-being of the Society, summarized the entomological work of the past year, referring in detail to the more important works which had recently been published, and then passed on to a general consideration of the bearing of the theory of evolution on our views of nature. Mr. Lucas exhibited a specimen of the earwig, *Forficula lesnei*, taken at Reigate in October, 1897, by Mr. West (Greenwich), of which only two specimens had previously been recorded in Britain, and contributed notes on its structure habits and occurrence. [See p. 49.]

February 10th.—Mr. J. W. Tutt, F.E.S., President, in the chair. Mr. E. J. Crow, of Brixton, and Mr. E. R. Hillsworth, of Stratford, were elected members. It was announced that Mr. Mansbridge had resigned, owing to his leaving England, that Mr. Tunaley, F.E.S., had

been chosen to fill the vacancy as Vice-President, and that Mr. H. Moore had been elected on the Council. Mr. McArthur exhibited underside varieties of *Lycæna* (*Polyommatus*) *bellargus* and *L. (P.) corydon*, the latter being almost devoid of ocelli. Mr. Dennis, three parts grown larvæ of *Callimorpha hera* from ova sent by Mr. Tutt while collecting in the Alps in 1897. They had fed all the winter. Mr. Tunaley, long bred series of *Retinia resinella* from Aviemore. Mr. Routledge, a variety of *Epinephele* (*Enodia*) *hyperanthes* from Carlisle, having a broad whitish submarginal band on the under sides of the hind wing embracing the ocelli; and also two females of *Acosmetia caliginosa*,* taken in the same locality by Mr. Day. Mr. Lucas, imagines and living nymphs of *Calopteryx splendens* from Fleet, and contributed notes on the specific characters and habits of the nymphs. Mr. Adkin, specimens of *Dianthæcia luteago* var. *barretii*, from Howth. Major Ficklin, a form of the same species taken in Cornwall, which Mr. Tutt had named var. *ficklini*. Mr. Tutt, on behalf of Rev. F. E. Lowe, of Guernsey, a third form bred from pupa taken under *Silene maritima*, and which he had named var. *lowei*. A considerable discussion ensued on the singular variation shown in this species, practically invariable in the same locality, but each locality possessing a distinct race. Mr. Tutt also exhibited, on behalf of Mr. Lowe, a fine aberration of *Melanippe sociata*, in which the central band of the wings was almost completely obliterated; and on behalf of Mr. Pearce, of Hackney, all the melanic specimens of *Hemerophila abruptaria* bred by him during the last three years, some dozens, including extremes and intermediates, and one partially gynandrous specimen.—H. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—December 20th, 1897.—Mr. G. T. Bethune-Baker, President, in the chair. Mr. E. J. Denham, 81, Hugh Road, Small Heath, was elected a member. Mr. R. C. Bradley, showed *Hadena glauca* and *Anaitis plagiata*, from Sutton; and *Ephesia künniella*, from his office in Digbeth. Mr. P. W. Abbott, a nice little series of *Cymatophora fluctuosa*, taken in Wyre Forest, last June, rather pale in colouring; also a specimen of *Sesia culiciformis* with a white band, also from Wyre Forest; this last was a dark-black looking specimen, darker than usual, excepting the band, which was white. Mr. C. J. Wainwright, a box full of Aculeate Hymenoptera, including four male specimens of *Odynerus lævipes*, from Wyre Forest, a rare insect, which, however, seems well established in that locality; *Andrena humilis*, a male from Wyre Forest, and some wide-banded vars. of *Apis mellifica*, from Eisenach, Thuringia. Mr. A. H. Martineau remarked that Mr. E. Saunders gives as a character of *O. lævipes* yellow patches on both hind pairs of legs, but on all the Midland specimens he has seen they were on the middle pair only. Mr. Martineau showed sticks containing the cells from which he had bred several *O. lævipes*, from Malvern; also sticks containing cells of *Pemphredon lugubris*, *Anthophora fucata*, Panz; and *Osmia leucomelana*. Mr. G. T. Bethune-Baker, two drawers of Pierids, containing a fine series of *Anthocharis*, including *A. pechi* from Algeria, and other rare species, and the genera *Zegris*, *Leucophasia*, &c.

* *Hydrilla palustris*, ante, p. 72.—Ed.

January 17th, 1898.—The President in the chair. Mr. R. C. Bradley showed *Theriopterus solstitialis*, taken before 8 a.m., hovering in the road opposite his house at Sutton. Mr. A. H. Martineau showed a set of specimens illustrating the life-history of *Andrena cineraria*, L.: larvæ young and full-fed, pupa, pupal skin, cells, and male and female. Mr. P. W. Abbott, a series of *Bryophila glandifera* from Devon, one very beautiful specimen being of a much richer and more beautiful green than usual, with the markings softened considerably. Also a *Lycana ægon* with the red marks gone from right upper wing, and blue shadings over them all; and a *L. bellargus* (female), also shot with blue; both from Midhurst, Sussex. Mr. G. T. Bethune-Baker, two drawers of the genus *Colias*, from his collection, containing many rare species.

February 7th, Annual Meeting.—Mr. G. T. Bethune-Baker in the chair. The Annual Reports of the Council, Treasurer, and Librarian were received, and the Officers and Council elected, Mr. G. T. Bethune-Baker being elected President; Mr. P. W. Abbott, Vice-President; Mr. R. C. Bradley, Treasurer; Mr. A. H. Martineau, Librarian; and Mr. C. J. Wainwright, Secretary. Mr. P. W. Abbott exhibited *Hemerophila abruptaria*, one of the ordinary pale form, from Sutton Park, the remainder from North London, all more or less dark; one of these latter was taken on the door of a coal-cellar, and was very dark, quite evenly suffused with dark amber, with the black transverse markings clear, and a trace of some of the light lines showing; the remainder were bred by Mr. W. A. Southey, and one of them was as dark as the caught one, the others showing the usual arrangement of colours and markings, but being generally darker; the thoraces remained light in the darkest specimens. Mr. R. C. Bradley showed *Diodontus tristis* (a male and two females); one *Pemphredon lethifer* (male); one *Psen pallipes* (female); and *Sphecodes pilifrons* (male), all from Sutton, 1897.—COLBRAN J. WAINWRIGHT, Hon. Sec.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Annual Meeting, January 10th, 1898.—The following officers were elected:—President, Mr. S. J. Capper; Vice-president, Mr. B. H. Crabtree; Joint Secretaries, Messrs. F. N. Pierce and the Rev. R. Freeman; Hon. Treasurer and Librarian, Mr. H. Locke. The members of the Council elected were:—Mr. W. E. Sharp, Dr. J. W. Ellis, F.E.S., Rev. A. M. Moss, Dr. H. Bailey, and Mr. F. C. Thompson. The following candidates were elected by ballot:—F. M. Saxby, D. Armstrong, E. G. Isaac, Albert Tipping, and William Perkins. In the course of the evening the President, Mr. Samuel J. Capper, F.L.S., F.E.S., a veteran naturalist, delivered his annual presidential address. It was a very exhaustive and interesting treatment of entomological subjects. He remarked that the past year had left an encouraging record. The papers read at the Society had been excellent, and the discussions most interesting, while at the same time the number of members had increased. They should have liked to have seen a more regular attendance at all the monthly meetings, for while some had been crowded, others had been quite the reverse. Dealing with entomological literature, the President said that previous to the last few years that class of literature had been almost wholly devoted to systematising; and further, the various systems of classification that had from

time to time been brought out had been nearly always based upon imaginal structure; the earlier stages of the insects, until quite recently, were greatly overlooked. In entomology, as in all other sciences, the specialist had been developed. From the host of specialists now at work, generalisations on a sound basis might be formed, and in fact were now forming; and although it might appear at first sight to be making "confusion worse confounded" to have to unlearn much that had been taught by former masters in science, they must remember that the words of Tennyson, "The old order changeth, yielding place to new," applies as much to entomology as it does to other matters, and that the end and aim of all science should be truth. Latterly the spread of evolutionary ideas, with their influence on all scientific thought, had directed entomological literature into an entirely new channel; and, guided by this light, the true relationship of species is sought. What is said of entomology applied to all branches of Natural History. The Linnean system of botanical classification, though wonderfully ingenious, had long since given way to what is styled the natural arrangement. The periodical literature of entomology played an important part in the progress of the science, and, more than anything else, had helped to make it a popular study. In conclusion, in speaking of scientific literature, Mr. Capper said they would gratefully acknowledge what the Board of Agriculture had done by the publication of separate reports and leaflets, and by papers in the 'Journal of Agriculture.'

ENTOMOLOGICAL CLUB.—Meetings of this Club since last report (Entom. xxx. 96) were held as follows:—

1897.—July 7th: Loanda, Beulah Hill, Upper Norwood; Mr. Samuel Stevens in the chair. August 12th: Trent House, Burton-on-Trent; Dr. Philip B. Mason in the chair. November 24th: Wellfield, Lingard's Road, Lewisham; Mr. Robert Adkin in the chair.

1898.—January 18th: The Entomological Salon, Holborn Restaurant; Mr. G. H. Verrall in the chair.

RECENT LITERATURE.

Publications issued by the U. S. Department of Agriculture, Division of Entomology:—

Revision of the Tachinidæ of North America: a Family of Parasitic Two-winged Insects. By D. W. COQUILLET. Pp. 154. Washington. 1897. (Technical Series No. 7.)

Proceedings of the Ninth Annual Meeting of the Association of Economic Entomologists. Pp. 87. Washington. 1897. (Bulletin No. 9, New Series.)

*The Gipsy Moth in America: a Summary Account of the Introduction and Spread of *Porthetria dispar* in Massachusetts, and the Efforts by the State to Repress and Exterminate it.* By L. O. HOWARD. (Bulletin No. 11, New Series.)

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NOTES ON LEPIDOPTERA FROM THE MEDITERRANEAN.

By Fleet-Paymaster GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

WE left Plymouth on Sept. 6th, 1896, in H.M.S. 'Endymion,' en route to the Mediterranean, with a new crew to recommission H.M.S. 'Hawke' at Malta. On the afternoon of the 8th we called at Vigo, and remained there until five p.m. the following day. The next morning I landed after breakfast with one of my messmates, and went for a long walk by the road which leads out to the north-east of the town, and runs just above and parallel with the beautiful harbour. As soon as we got clear of the town and suburbs, we passed gardens and vineyards and small fields containing Indian corn, melons, tomatoes, &c. Grape-picking and wine-pressing were in full swing. The slopes of the hills facing the harbour were cultivated for about two-thirds of their height, but above this the ground became poor and rocky, and more or less overgrown with pine trees. Numerous ravines intersect the hills, and we crossed several bridges during our walk. The day was fine, bright, and delightful, and after proceeding for some four miles or so we turned up one of the ravines, the sides of which in many places were thickly clothed with Spanish chestnut, poplars, oaks, and a few fir trees; while in the more open spots there was a profusion of heath, broom, wild sage, sun-cistus, &c. *Pieris daphidice*, *Colias edusa*, and *Pararge megæra* were plentiful, and in fine condition; *Lycæna telicanus* was flying about heath, and *L. argiolus* over bramble. Once or twice I saw a brilliant copper, probably *Polyommatus virgaureæ*, but not having a net with me I was unable to secure a specimen; now and then *Pyrameis atalanta* passed along, and these, with one or two *P. cardui*, *Pieris rapæ*, and *P. brassicæ*, comprised all the butterflies I noticed at this place.

We arrived at Malta on Sept. 17th, turned over to the 'Hawke' on the 18th, and left again on the 22nd to join the Levant Division of the Mediterranean Fleet at Lemnos, where we arrived on the 25th, and remained until Oct. 5th. It rained heavily for two or three days during our stay. Oct. 2nd was fine and bright, and I went on shore early in the day, and strolled about the hills near the harbour. The country was rather bare of vegetation at this time of year, the ground was very rough and stony, and the walking difficult, and moreover it was intolerably hot. In some of the little valleys there was a certain amount of vegetation, composed mostly of scrubby bushes of a prickly nature. I saw *P. cardui* in abundance, and a few *C. edusa*, *L. icarus*, *P. phlœas*, *Deiopeia pulchella*, and *Nomophila noctuella*; and upon fennel there were a few larvæ of *Papilio machaon*. It was, however, too late in the season to expect much. I dare say in the spring some interesting species might be found here.

We arrived at Salonica on Oct. 6th. This important place is situated upon extensive slopes at the head of a deep bay. The old part of the town was formerly surrounded by a high wall, 36 ft. thick, a considerable portion of which still remains. Behind the town, particularly to the eastward, there is a series of lofty hills, many of them clothed with thick forest; and away in the distance, to the south-west, facing the town, is the mighty Mount Olympus. As we steamed up the bay, on our left hand we passed a large extent of flat marshy ground. From what I could see of the country, I should imagine that it would be a capital place for collecting in during the spring and early summer months, but while we were there it was not possible to get about much on account of the dangerous and unsettled state of the country. We were not allowed to go outside the town except in parties of four or five together, and then we had to go armed. We remained at this place until Oct. 23rd, and while there, in the neighbourhood of the town, I took or noticed the following:—

Pieris brassicæ, *P. rapæ*, and *P. daplidice*. Common.

Anthocharis belia. A few.

Colias edusa. Common and fine.

Pyrameis cardui. Abundant. Larvæ plentiful, feeding between spun-up leaves of mallow.—*P. atalanta*. Common.

Lycæna bœtica. One.—*L. telicanus*. Abundant.—*L. icarus*. Abundant.—*L. astrarche*. Abundant; a fresh brood.

Polyommatus phlœas. A few.

Deiopeia pulchella. Common.

Plusia gamma. Common.—*P. daubei*. One.—*P. chalcytes*. Several. *Mecyna polygonalis*. Several. Larvæ common and gregarious, feeding upon a species of *Cassia*.

Nomophila noctuella. This species swarmed on board at night, attracted by the electric lights.

On Oct. 10th I went by rail with a shooting party to a place called Karasuli, about thirty miles from Salonica, and was surprised to see some worn specimens of *Argynnis pandora* still on the wing. I believe there must be two broods of this species during the summer, for I remember meeting with it as late or later than this some years ago at Chanak, at the mouth of the Dardanelles.

We left Salonica on Oct. 23rd, and arrived at Salamis Bay on 26th. The hills to the north of this bay are clothed with pines, with an undergrowth of sage, sun-cistus, heath, and a variety of aromatic shrubs. Walking was extremely difficult, as the ground was covered with large blocks of volcanic stone with nasty jagged edges. From Salamis I made several excursions to Athens, Eleusis, &c., and noticed larvæ of *P. cardui* plentiful in the Acropolis, crawling over fallen marble blocks; and in a shady corner I took a beautiful fresh *Plusia chalcytes* sitting on a mallow-leaf, having just emerged from its cocoon, which was spun up beneath.

We left Salamis Bay on Nov. 13th, and reached Poros at 2 p.m. the same day. Poros is a small island just off the mainland, with which it forms almost a land-locked harbour. There is a small town and naval yard. The country is very bold and mountainous, and the slopes of the hills and ravines are clothed with scrub composed of wild olive, arbutus, ilex, "wait-a-bit" thorns, sun-cistus, plane trees, &c. At one end of the harbour there is an extensive plain with marshy patches here and there. It looks a nice country for collecting in, and no doubt a number of good insects might be found here in the spring and early summer. During our stay I noticed *P. rapæ* and *P. brassicae* very abundant; *C. edusa*—a small form—plentiful, with several var. *helice*; *Cænonympha pamphilus*, *Pararge egeria* var. *egerides*—the English form; and the larvæ of *Mecyna polygonalis* plentiful upon *Cassia*. The following is a description of it:—Head shining black, mouth pale yellow; a broad greyish blue dorsal stripe followed by a broad shining black stripe, and then a broad yellow stripe, which includes the spiracles; under parts greenish brown; upon each segment there are three or four small shining black warts, each of which emits a fine whitish bristle; legs black. In confinement, when full-grown, the larvæ spun tough cocoons of fine white silk among the leaves of their food-plant, in which they changed to rather elongated reddish brown pupæ. They are handsome larvæ, and are easily seen, as they are gregarious and feed quite exposed upon their food-plant. The first moth appeared on Dec. 5th, the second on Jan. 14th, and the remainder between the latter date and March 9th—a nice little series.

We left Poros on Nov. 22nd, and after stopping for a day at Argostoli, in the island of Cephalonia, proceeded to Malta, where

we arrived on the 25th; and here we remained until April 1st, 1897. Malta is not a place where one would expect to find a great variety of insects, for upon approaching it from the sea during the greater part of the year it looks anything but inviting to an entomologist, as it presents a dried and burnt-up appearance, and, with the exception of a few carob trees, there is nothing to relieve the monotony of the stone walls and brown soil. Even in the winter and spring months it is difficult to believe that so much is grown upon the island, for upon travelling along the road you see scarcely anything but the stone walls that surround the fields. But take the train to Citta Vecchia, and walk up to the old town that stands upon one of the highest points of the island, and turn back towards Valetta, and you will then look down upon a large expanse of country under cultivation. Every foot of ground that can be utilized has a crop of some sort upon it. The fields are small and divided by stone walls of from four to six feet high. This is to protect the crops from the prevailing winds which are frequent and strong during the winter and spring. February and March are the months to see the island at its best; then the fields are green with corn, potatoes, beans, &c., and some of them are scarlet with the flowers of a species of clover, called by the natives "sulla" (*Hedysarum coronarium*), which forms valuable fodder. Here and there you will notice patches of a bright primrose-yellow, which is caused by the flowers of an *Oxalis*, a most pernicious weed, which grows nearly everywhere. It is a delicate-looking flower upon rather a long weak stalk, and it is a pretty sight to see a large mass of this waving to and fro in a gentle breeze. It dies away altogether during the hot season, but is one of the first weeds to spring up after the autumn rains.

The central part of the island is more or less flat or undulating, with hills towards the coast-line, and it is divided in many places by valleys or "weids" which run towards the sea. Some of them are tolerably wide and deep, and are well protected from the winds, and in several of them, particularly at Boschetto, Zurrico, &c., there are beautiful orange gardens, which are delightful and favourite places for picnics. The "weids" running down from Boschetto under Verdala Palace, the governor's summer residence, past Siggieni and Zebbug out on to the Marsa, and another near Birzubbugia were my favourite hunting grounds. Here from the end of October to the end of March plenty of wild flowers are to be met with. Two or three kinds of sweetly-scented narcissus, a small purple crocus, a yellow tulip, grape hyacinths, anemones, scarlet pheasant's eye, various heaths, and a number of others. The only indigenous trees are, I think, the carob and wild fig. There are a few bushes—a stunted *Rhamnus*, upon which the larvæ of *Rhodocera cleopatra* feed, brambles, and some other low shrubs the names of which I do not

know. Upon the tops of many of the hills, where the soil is thin and the ground very stony, there is no attempt at cultivation, and here, as well as in some places that are reserved by the Government, there are quantities of asphodel which flower from December to February, and spiked star of Bethlehem. The upper part of the large bulb of the latter is usually above ground, and it throws out thick fleshy leaves in the winter and spring months, but they die away in the hot weather, and in September and October the plant sends up a single tall stem, three or four feet high, which terminates in a long spike composed of innumerable small white flowers, which at that time of year, when everything around is dead and parched up, have rather a singular and conspicuous appearance.

I will now give a rough list of the Lepidoptera I met with at Malta between November, 1896, and December, 1897:—

Papilio machaon, L.—Is to be met with between the middle of March and end of October in small numbers. There appear to be a succession of broods, and it is usually most plentiful in April and May. The larvæ are to be found upon fennel, which grows rather commonly about the island, but is mostly dead or dried up by the end of October, so I do not know what becomes of ova deposited by females that are then on the wing. It is possible that the eggs do not hatch until the following March, or the perfect insects may hibernate, although I do not think this is likely, as it would be contrary to the usual habits of the species. Maltese examples of this butterfly are large and dark.

Pieris brassica, L.—Abundant, and may be frequently seen on warm days during the three winter months. The females of the early autumn brood have the tips of their anterior wings broadly black, and the black spots are much larger than in those of the earlier broods.

Pieris rapæ, L.—Abundant, and occurs throughout the year. Some of the females of the autumnal brood are of a deep olive-yellow.

Pieris daphidice, L.—Common but local. Observed on Nov. 25th a fresh specimen on the slopes above Calcara Gate, where it was tolerably numerous during the first fortnight of March, 1897, at which period I noticed the females depositing their eggs on the under sides of the leaves of the wild radish. Another brood was on the wing on July 18th, upon which day something caught my eye as I was passing a small plant of wild yellow antirrhinum, and upon stooping down I saw it was an example of this species. I tried to box it, but it was too quick for me and flew off, and, after flying round and round for several times, it returned and pitched on the same flower. I again tried to box it, and again failed, when it repeated the same manœuvres, alighting again on the same flower; but this time I succeeded in boxing it. It was late in the afternoon, and the butterfly had evidently selected this particular flower for its resting place for the night; the colour of its hind wings harmonized well with the green and greenish yellow of its surroundings. The next day I noticed several flying on the slope above Calcara Gate.

Colias edusa, F.—Common throughout the year, and the var. *helice* occasionally seen.

Rhodocera cleopatra, L.—Rather scarce, but occurs all over the island, particularly in the “weids,” or rocky valleys, where its food-plant, a stunted thorny buckthorn, grows, and upon which I have seen the females depositing their eggs in February and March.

Polyommatus phlaeas, L.—Abundant. Seen in December, January, and February. At the end of July, 1897, it was swarming in several localities, and the specimens were very large and dark—the var. *eleus* of Fabricius.

Lycana batica, L.—Rare; only one or two met with.

Lycana astrarche, Bgstr.—Common and typical. The July brood the most numerous.

Lycana icarus, Rott.—Abundant. First noticed March 5th. In July it was swarming in certain places, and this brood was much larger and much more strongly marked than those seen in the early part of the year. In some cases the males have three or four conspicuous black spots on the hind margin of the posterior wings, near anal angle, and the narrow black marginal line is as wide and distinct as in *L. agon*; the spots on the under sides are very large, black, and broadly ringed with white, and the marginal series of orange-peacock spots are bright and large. The females are large, have no vestige of violet, but are as dark as *L. astrarche*, and for some time I thought I was taking that species; their under sides are exactly the same, except for the addition of the two basal spots on the fore wings. It is a very distinct variety. The violet in the wings of the females of the spring brood is very slight.

Vanessa atalanta, L.—Common.

Vanessa cardui, L.—Abundant. Larvæ on thistles, and spun up between leaves of mallow.

Pararge megæra, L.—Common, and there seems to be a succession of broods throughout the year; those met with during December and January are smaller and darker than the spring and summer broods.

Pararge egeria, L.—Common but local. A succession of broods. Some of the examples very richly marked. Orange gardens at Boschetto, gardens of St. Antonio Palace, “weid” near Zurricco, &c.

Epinephle ianira, L., var. *hispulla*, Hb.—Common but local, occurring in the “weids,” St. Antonio Gardens, &c. First noticed on July 10th, but it was probably out much earlier than that date. I was not at Malta during April, May, or June. They remained a long time on the wing, as I observed them well on into October. Some of the females I have taken are very large bright specimens.

Cænonympha pamphilus, L.—Abundant. The spring and early summer broods are the typical form, but at the beginning of July the var. *lyllus*, Esp., appears, and is much more plentiful than the type; some of the females taken are very large and strongly marked.

Deilephila euphorbiæ, L.—Abundant in the larva state. A succession of broods from May to October. Full-fed larvæ were found on July 10th, and small larvæ, only just hatched, were seen as late as Dec. 4th, but it is doubtful if these latter would ever attain full growth, for they would hardly be able to stand the rain and cold nights that were then setting in. The parent moths do not seem to exercise much judgment in depositing their ova, for I often noticed three or four young larvæ upon a small plant not more than three inches high, and no other

plant within a hundred yards of them; in many instances again I have seen several small larvæ upon a diminutive plant, while large robust plants close at hand had none on them. They suffer a good deal from the attacks of enemies; centipedes and carnivorous beetles prey upon them at night. I used to watch certain larvæ to note their rapidity of growth, &c., and often when I visited them again nothing but their shrivelled-up skins remained.

Macroglossa stellatarum, L.—Abundant. One afternoon in the Floriana Gardens I saw more than a hundred flying before the flowers of a small evergreen privet. It was a very pretty sight. They are also very partial to the flowers of the lantana.

Emydia grammica, L.—One specimen.

Deiopeia pulchella, L.—Not common.

Arctia villica, L.—One crushed larva upon a road near Zurricco.

Euprepia pudica, Esp.—This is a common species. The perfect insect appears from July to September, and I have taken it sitting on walls, &c. The larvæ feed on various kinds of grass, and may be found in waste places under stones from the beginning of December until the middle of March, when they are full-grown. The larva is pale smoky brown tinged with red; upon each segment there are six raised shining black spots emitting fascicles of stiff bristles, those in the centre dark brown, the outer ones reddish; three of these spots are situated above, one just behind, and the remaining two are just below the spiracles; the dorsal stripe is rather broad and pale yellowish brown, and is followed by a pale smoky stripe mottled with darker blotches, and below this a pale straw-coloured stripe which includes the spiracles, and extends to the ventral surface; head dark brown with a paler V-shaped mark above the mouth, which is black; legs and prolegs reddish brown. The skin is shining, and the larva feels hard to the touch; it curls into a ring when annoyed, and remains in that position for a considerable time. When full-grown the larva spins rather a tough cocoon composed of whitish silk and pieces of grass, and does not change to a pupa until a week or two before the moth emerges. When we left Malta on April 1st I had about thirty cocoons, and the first moth appeared on July 19th, at which time the larvæ in the remaining cocoons were still unchanged.

Spilosoma fuliginosa, L.—Not uncommon. A full-grown larva, taken on Dec. 31st, produced a large dark female on Jan. 30th. On March 8th I took a female sitting on a stone; on the 13th of the same month another female flying in the hot sun; and I have upon several occasions noticed the remains of the moths lying on the roads.

Cossus ligniperda, F. (?).—I have smelt the larvæ of this species frequently, though I have not as yet met with the perfect insect.

Psyche sp. ?.—Larva-cases abundant, but I have not succeeded in breeding any of the moths.

Bombyx trifolii, Esp. (?).—Larvæ of what I take to be this species were abundant from January to March, but I did not breed any, though several of my larvæ spun cocoons. On Oct. 25th I took a male at rest on a wall. It is certainly not like our English species, as it is of a uniform brown, with very indistinct fascia, and is probably referable to Guenée's *iberica*.

Agrotis upsilon, Rott.—One specimen.

Polia sp. ?.—During December and January a very handsome larva was by no means uncommon feeding exposed upon various flowers, especially those of a sweet-smelling narcissus. In October I bred several of the moths, and they appear to come very near *Polia xanthomista*, Hb., var. *nigrocincta*, Tr., although the larvæ do not agree in any way with Buckler's description. I will defer giving any description of the larva until I have ascertained what the moth really is.

Calocampa exoleta, L.—Larvæ common in January and February, feeding exposed upon a variety of wild flowers.

Plusia gamma, L.—Common.

Acontia luctuosa, Esp.—Common.

Thalpochares ostrina, Hb.—Common.

Thalpochares parva, Hb.—Common.

Metoptria monogramma, Hb.—One example.

Sterrhia sacraria, L.—Common.

Anaitis plagiata, L.—Several.

Cidaria bilineata, L.—Common.

Eupithecia pumilata, Hb.—Several bred.

Botys ferrugalis, Hb.—Common.

Nomophila noctuella, Schiff.—Abundant.

I did no night-work, or the above list would no doubt have been much longer.

(To be continued.)

A CATALOGUE OF THE LEPIDOPTERA OF IRELAND.

By W. F. DE VISMES KANE, M.A., M.R.I.A., F.E.S.

(Continued from p. 64.)

CAMPTOGRAMMA BILINEATA, L.—Extremely numerous everywhere. It presents every shade of variation from the bright yellow form, with almost obsolete waved transverse lines, and the pallid ab. (and var.) *testaceolata*, Stdgr., which occurs on the limestone districts of Clare and Aran, to the black variety *isolata*, Kane. Most of the variations occur with the type everywhere; but var. *testaceolata* and the banded aberration appear to be somewhat topomorphic; while the var. *isolata* is a local form. A paper dealing with this subject appeared in the 'Irish Naturalist' of March, 1896, to which I would refer for fuller details. Succinctly stated, the following is the gist of my researches on the variation of this species. The form with the margins of the median band, especially the outer one, shaded with fuscous and sometimes edged with black, which I call the "banded aberration," is found very widely both in Ireland and Great Britain; but is occasional and somewhat scarce, and is rarely localised. It appears in company with clouded forms like those from Unst on the margins of bogs in Connemara near

Glendalough, Aasleagh, and elsewhere. This local tendency to dark scaling I attribute to adaptation to a moorland environment, as here it appears to be in process of establishment as a local variety. On the dark, bald cliffs of Kerry, at Dursey Island and the neighbouring mainland, a very dark form occasionally occurs, more melanic than the Unst specimens, the fore wings being of an almost unicolorous fuscous brown, and the hind wings of an ochreous brown—*ab. infuscata*. Upon a rock islet, a considerable distance from the Kerry coast, where a sparse vegetation of thrift creeps up the slopes between the rocks, I discovered the var. *isolata*, but fear it has since disappeared, though then fairly numerous. The continuous Atlantic storms of the winter of 1893-4 soaked the shaven sward with deluges of sea-water to such an extent that it withered away in spring. This melanic form I consider owed its origin to protective adaptation coupled with complete isolation. The close herbage affording no refuge for imagines (which probably were of the mainland race already tending toward dark aberrations), they had to rest on the dark rocks; and the paler specimens no doubt fell a prey to the birds and bats. Thus a stable melanic variety arose, and became constant by in-breeding. Among a large number taken on this islet on two occasions not one approached the ordinary coloration, but were uniform in their black hue. The following is a description of this interesting form:—Var. *isolata*. With all the wings of a sooty black, upon which the waved strigæ and median band are marked in darker tone. The hind wings in some instances are shot with a yellowish tinge. The body and under side of the wings are also of sooty black. The size is above the average, which is a proof that the dark scaling is not a result of dwarfing or diseased conditions.

CAMPTOGRAMMA FLUVIATA, *Hb.*—I have only occasional captures of this moth to record. It does not seem to be anywhere numerous, though perhaps this may be due to ignorance of its habits, and the appropriate method of capture. Howth and Malahide (*B.*); Limerick (*T.*); Timoleague, Co. Cork (*D.*); Clonbrock, Co. Galway (*R. E. D.*); Markree Castle, Co. Sligo; Derry and Cushendall (*C.*); Ballycastle, Antrim.

PHIBALAPTERYX TERSATA, *Hb.*—A single worn specimen of this species was taken in a garden at Howth, August 21st, 1891, by Mr. Maurice Fitzgibbon. Whether a casual importation or introduced with shrubs there is no means of judging; but so far the capture is unique in Ireland.

PHIBALAPTERYX LAPIDATA, *Hb.*—The late Stephen R. Fetherston-H., a friend of Birchall, was the first to discover this insect in Ireland. He took it in some numbers on the range of moorland belonging to his brother at Glenmore near Crossmolina, Co. Mayo, where I have since met with it. It can be taken at light,

as well as in the daytime, and probably exists in many other similar situations in Ireland; as subsequent captures by Mr. Watts on the hills near Belfast; at Leenane, Connemara, by Lieut. Walker, R.N., and Chapman (E.M.M. xxv. p. 213); and Lissadell, Co. Sligo, by Mr. Vivyan;—show a very wide range of distribution.

PHIBALAPTERYX VITTATA, Bork.—This insect has undoubtedly a wide range, though it seems to have escaped the notice of many collectors in Ireland. For some years I only met with occasional examples; until on the banks of the Shannon near Banagher, and at Belleisle, Co. Fermanagh, I found it very numerous. Mr. Watts reports it equally abundant in the marshes about Belfast. Other localities are as follows: Co. Wicklow (*Bw.*); Lough Oughter near Farnham, Cavan; the Geragh (Macroon) and Cork (*S.*); Moycullen, Connemara, and Clonbrock, Co. Galway; Favour Royal, Co. Tyrone; Castle Bellingham (*Thornhill*).

PHIBALAPTERYX VITALBATA, Hb.—As the food-plant *Clematis vitalba* is not indigenous to Ireland, but has been introduced into demesnes and pleasure-grounds, we cannot claim this species as Irish. Nevertheless, as in the case of *P. tersata* at Howth, a single specimen is recorded from Clonbrock, Co. Galway, by the Hon. R. E. Dillon. I have, however, a note of its common occurrence at Mallow, but not having seen an example give it with reserve.

TRIPHOSA DUBITATA, L.—Kingstown (*Greene*); Howth, not rare; also specimens have come to the lantern of Rockabill Lighthouse off the Dublin coast. It is also found on the Co. Louth coast at Castle Bellingham (*Thornhill*); and at Grey-stones, Co. Wicklow; also on the shores of Lough Foyle near Derry (*C.*). At none of these coast localities, to my knowledge, is buckthorn found; and therefore the food-plant is probably blackthorn. The late Mr. Fetherston-H. was of opinion that Irish examples were more richly coloured than those of Great Britain with a purple gloss. In Galway it is not rare at Ardrahan (*Miss N.*); and at Clonbrock the hibernated females are fairly numerous when beating the shallows in spring. I have not seen the var. *cinereata*, St.

EUCOSMIA UNDULATA, L.—Apparently widely distributed, but I have never found it plentiful. A few have been taken at the following places: Powerscourt, Co. Wicklow (*B.*); Cromlyn (*Mrs. B.*) and Cookesborough, four (*Miss R.*), Co. Westmeath; Kells, Meath (*G. V. H.*); Owencunliffe Glen, Killarney, numerous (*W.*); and near Kenmare; Glandore, Co. Cork (*D.*); Crossmolina, Co. Mayo; Markree Castle, and Rockwood near Sligo; Limavady, Co. Derry (*the late Canon Grainger*).

CIDARIA SITERATA, Hufn.—Throughout Ireland, and in certain

localities very plentiful. The males vary in the strength of the red flush on the fore wings. The females differ in the depth of the green, which is often very rich and dark, without any red tint, and reducing the paler markings considerably in extent. Others are much paler, marbled with strigæ, and pale patches, so as in some cases to approach a strongly-marked *C. miata*. I have not seen the very dark banded female here, which is taken in the New Forest. It is useless to give more than a few localities to show the wide distribution. Dublin and Wicklow, sometimes fairly plentiful; Cappagh, Co. Waterford, not common; Mucross, Killarney, very abundant, and elsewhere in Kerry; Co. Galway, ditto; Markree and about Sligo, not very plentiful; Killynon, Westmeath, Drumreask, abundant; Derry, scarce; &c.

CIDARIA MIATA, L.—Usually commoner than the preceding, and of equal range.

CIDARIA CORYLATA, Thnb.—Widely distributed, but somewhat local. Plentiful in some localities, but usually not numerous. It varies much in the median band of the fore wing, which is sometimes a very dark olive-brown without markings. In the lighter-coloured examples pale waved lines break up the centre of the band. A frequent variation is found in the band being much constricted towards the inner margin, in many places disconnecting the wide costal portion from the rest. In the latter form the outer edge of the band is very deeply dentated, more so than in the normal form. I have never seen the Scotch form in which the yellow crenulations are absent, except a single example in Mr. Dillon's cabinet at Clonbrock; and the var. *albocrenata*, Curt., seems absent from Ireland. Common in Co. Wicklow (B.) and Powerscourt; Killarney; common in parts of Galway; Markree Castle and near Sligo, scarce; Killynon, Co. Westmeath; Favour Royal, Co. Tyrone, abundant; Farnham, Cavan; Armagh (J.); Derry, a few (C.); Ballycastle, Co. Antrim.

CIDARIA TRUNCATA, Hufn.—Everywhere common. The Irish insect seems to be a very sober tinted form. Very rarely have I met with any of the marbled and brightly-coloured varieties seen in English collections. As might be expected, therefore, the var. *perfuscata*, Haw., is occasionally met with; also var. *commenotata*, at Clonbrock and elsewhere.

CIDARIA IMMANATA, Haw.—Extremely numerous everywhere; and with a wide range of variation both among the dark and handsome coloured forms var. *marmorata*, Haw., and those with white median bands. Specimens of ab. *unicolorata* also occur; but I have not seen the ab. *thingvallata*. This insect, therefore, does not seem to follow the above closely-allied species in adopting a sombre livery in Ireland, though a very dark grey form

prevails on the mountains among which the river Roughty takes its rise near Kenmare, Co. Kerry. Here it would seem that the moorland surroundings and the dark rocks upon which it rests have induced adaptive coloration. I took a large series here to test the uniformity of the pattern, which was remarkable.

CIDARIA SUFFUMATA, *Hb.*—Generally distributed, and usually abundant. It varies considerably, the median and basal bands being sometimes of a very blackish brown, with a pale trait on the costa; but usually it is of lighter tint, and somewhat variegated with sinuous shading. The whitish bands on each margin of the median dark band are often darkened with fuscous, a transition stage to the var. *piceata*, *St.*, which I have not taken.

(To be continued.)

FURTHER NOTES ON *ANDRENA*.

By T. D. A. COCKERELL.

Andrena perarmata, n. sp.

♂. Length 9 to 10 mm., black; the head and thorax clothed with rather dense very long mouse-coloured pubescence, becoming dull white on the ventral surfaces, and black at the sides of the face and round the antennæ; some few black hairs also on the scutellum. Head large, broader than thorax, facial quadrangle much broader than long, cheeks broad, and produced beneath into a right angle; mandibles long and slender, ferruginous at tip, tuberculate at base, and produced beneath at the base into a prominent tooth, deeply notched within at some distance from the tip. Face and front dullish, clypeus strongly and quite closely punctured, area in front of the ocelli striate; antennæ long, reaching to metathorax, wholly dark. Thorax dull, with a minutely roughened surface, enclosure of metathorax minutely roughened and ill-defined; tegulæ shining piceous; wings hyaline, iridescent, the apices faintly dusky; nervures and stigma brown, the stigma very dark; second submarginal cell small; legs black, hind tarsi dark brown; pubescence of legs long, mouse-colour; anterior coxæ large, swollen in front; tarsi very slender. Abdomen shining, microscopically tessellate and hardly punctured, with thin and sparse mouse-coloured pubescence, not forming bands or concealing the surface; some short black hair, not readily noticed, on dorsum of second to fifth segments; hair of apex tinged yellowish.

Hab. Seattle, Washington (T. Kincaid). Many specimens. March 15th, 1897; March 16th, 1896.

Near to *A. mandibularis*, *Rob.*, but that is smaller (8 mm.), with sparsely punctured clypeus and honey-yellow nervures. *A. fragilis*, *Sm.*, differs at once by the shining thorax and pale testaceous nervures. *A. nigrihirta* (*Ashm.*, as *Cilissa*) is also in some respects similar, but has not the peculiar head-characters

of our insect. The European *A. ovina*, Kirby (male), also reminds one a little of *A. perarmata*.

In the Mesilla Valley, New Mexico, I have taken a wild bee (*Halictus pruinosus*) as early as March 18th, but it is quite the end of March before the early Andrenidæ are well on the wing. Here we have *A. perarmata* appearing at Seattle, so much further north, as early as March 15th, and in quantity!

Andrena cærulea, Smith, var. nov. *territa*.

♀. Length about 9 mm. Differs from Smith's description of *cærulea* by the quite long erect pubescence of the head and thorax being white, with some black hairs intermixed on the sides of the metathorax, and especially at the sides of the face. The pubescence of the legs is mostly sooty, but that on the anterior femora is entirely white, and the floccus of the posterior femora is pallid. The greenish fringe of the microscopically tessellate abdomen is quite marked, and the whole insect is rather of a greenish blue. The wings are hyaline, not noticeably darker at the apex, but throughout with a slightly dusky tint. Nervures and stigma dark brown, stigma pallid in the middle. There are no distinct hair-bands, but the sides of the abdomen show some shining white hairs; the venter exhibits three interrupted white hair-bands; the pubescence of the apex might be called obscure fulvous; it is a kind of pale reddish chocolate. Flagellum after the third joint brownish beneath; clypeus tessellate, and with sparse shallow punctures, its disc showing prismatic colours—purple, green, and blue. Process of labrum broad and truncate. Mesothorax dull, minutely roughened, with scarcely observable shallow punctures; basal enclosure of metathorax roughened, scarcely defined at all. Tegulæ dark chestnut colour, with some blackish hairs; some blackish hair also occurs on the sides of the prothorax.

Hab. Olympia, Washington (T. Kincaid). May 23rd, 1894. The following table separates the females of the blue *Andrenæ* of the north-west:—

Pubescence of apex of abdomen black, of face also black	<i>nigrocærulea</i> , Ckll.
Pubescence of apex of abdomen brownish, of face mostly pale.	
Pubescence of thorax ochraceous, on metathorax black	<i>cærulea</i> , Sm., 1879.
Pubescence of thorax white, the few black hairs inconspicuous	<i>territa</i> , Ckll.

Andrena melanochoa, n. sp.

♀. Hardly 7 mm. long, black, with short and thin dull whitish pubescence, inclining to mouse-colour dorsally. Facial quadrangle broader than long; clypeus minutely tessellate, with sparse but strong punctures; vertex granular, front below ocelli very finely striate; antennæ dark, feebly tinged with ferruginous beneath towards apex; first joint of flagellum as long as the two next together; mandibles stout with bifid dark ferruginous tips; process of labrum broad, trun-

cate with sloping sides; mesothorax dullish, minutely tessellate, hardly punctured; enclosure of metathorax roughened, scarcely at all defined; tegulæ fuscous; wings smoky hyaline, nervures and stigma reddish brown, second submarginal cell broader at top than third; legs black, with shining pale brownish pubescence; abdomen tessellate and impunctate; apical margins of segments 2 to 4 with thin white hair-bands, very broadly interrupted on 2 and 3, and narrowly on 4; apex with fulvous pubescence.

♂. Similar to the female. Face all black; pubescence longer and paler; at apex of abdomen dull white; abdomen not obviously fasciate; small joints of tarsi rufescent; wings more yellowish; stigma dull amber-colour with a dark margin.

Hab. Olympia, Washington (T. Kincaid). May 9th to 25th. This little species has the aspect of *A. zizæ* and *illinoensis*, but has none of the greenish colour of these species. Provancher's *A. vestita*, described only in the male, must be very similar to *melanochroa*, but will be known by the somewhat smaller size and the ferruginous-red tarsi.

Andrena macgillivrayi, Ckll.

Mr. Kincaid sends two females from Washington State, one from Seattle, May 11th, the other Olympia, June 2nd. The Washington form is a little larger (long. 11-12 mm.) than the type, the stigma is somewhat darker, and the face is a trifle broader. All the essential specific characters are the same as in the New York (Ithaca) type.

Mesilla Park, New Mexico, U.S.A.

TORTRICES OCCURRING IN THE VICINITY OF THE CHESHAM LINE.

ALTHOUGH there are a good many species to be obtained even in the neighbourhood of the stations between the Baker Street terminus and Willesden Green, it is not until we get beyond the latter and well into the country that we need think of alighting in quest of Tortrices. There are, however, some very decent species to be found in the neighbourhood of Kingsbury and Neasden Station, and a few hours may be pleasantly and profitably spent in a ramble around, especially if we turn in the direction of the Brent and Kingsbury old church. Harrow and Pinner have each something to offer, but we shall do better at Northwood, and it is this locality and the country around Chalfont Road that I have most frequently collected in. The latter is on the chalk and well wooded. Although Mill Hill on the Midland system does not properly belong to the district more immediately under consideration, I have included it because it

is not far distant as the crow flies, and it has produced several good Tortrices.

The following is a list of the species I have met with during sundry visits to the various places; but, with the exception of Mill Hill, I have rarely spent more than an afternoon at a time at any one locality. It is therefore highly probable that many more species would be found by more diligent working.

TORTRIX PODANA, Scop. = PYRASTRANA, Hübn. (*Lozotænia fulvana*, Wilk. Brit. Tort., 1859; Staint. Manual, ii. 1859. *Cacæcia podana*, Meyrick, Handb. Brit. Lep., 1896).—Widely distributed. The unicolorous form known as var. *fuscana*, St., occurs more frequently than the type in St. John's Wood. I have seen frequent instances of "assembling" in this species.

TORTRIX XYLOSTEANA, Linn. (*Lozotænia xylosteana*, Wilk. Staint. *Cacæcia xylosteana*, Mey.).—A generally common and variable species.

TORTRIX SORBIANA, Hübn. (*Lozotænia sorbiana*, Wilk.; Staint. *Cacæcia sorbiana*, Mey.).—I have only obtained this species at Northwood, but it does not seem to be very plentiful.

TORTRIX ROSANA, Linn. (*Lozotænia rosana*, Wilk.; Staint. *Cacæcia rosana*, Mey.).—A very common species throughout the whole area.

TORTRIX DIVERSANA, Hübn. (*Tortrix transitana*, Wilk.; Staint. *Tortrix diversana*, Mey.).—This species has sometimes occurred in profusion at Mill Hill and Kingsbury. It seemed to affect particular elm trees.

TORTRIX HEPARANA, Schiff. (*Tortrix heparana*, Wilk.; Staint. *Pandemis heparana*, Mey.).—Generally common, especially in the larval state.

TORTRIX RIBEANA, Hübn. (*Tortrix ribeana*, Wilk.; Staint. *Pandemis ribeana*, Mey.).—Also common, more particularly in fruit gardens.

TORTRIX CORYLANA, Fabr. (*Tortrix corylana*, Wilk.; Staint. *Pandemis corylana*, Mey.).—I have only seen this species at Northwood.

TORTRIX UNIFASCIANA, Dup. (*Lozotænia unifasciana*, Wilk.; Staint. *Cacæcia unifasciana*, Mey.).—Common almost everywhere.

TORTRIX PALLEANA, Hübn. (*Tortrix icterana*, Wilk.; Staint. *Tortrix paleana*, Mey.).—Larvæ often abundant in meadows at Mill Hill, Kingsbury, Harrow, Northwood, and Rickmansworth. The perfect insect is not so commonly in evidence.

TORTRIX VIRIDANA, Linn. (*Tortrix viridana*, Wilk.; Staint.; Mey.).—Generally abundant.

TORTRIX FORSTERANA, Fabr. (*Tortrix forsterana*, Wilk.;

Staint.; Mey.).—This species occurs throughout the whole area, but appears to be only moderately common. I have generally obtained specimens from ivy and honeysuckle, upon both of which plants the larva feeds.

TORTRIX MINISTRANA, Linn. (*Eulia ministrana*, Wilk.; Staint. *Tortrix ministrana*, Mey.).—Common. Flies rather high.

DICHELIA GROTIANA, Fabr. (*Dichelia grotiana*, Wilk.; Staint. *Epagoge grotiana*, Mey.).—Only met with at Mill Hill, but never more than two or three at a time. I used to beat it out from a hawthorn hedge under oak trees.

LEPTOGRAMMA LITERANA, Linn. (*Oxygrapha literana*, Wilk.; Staint. *Acalla literana*, Mey.).—Once met with in a lane adjoining Moor Park. This specimen was of the type form.

PERONEA SPONSANA, Fabr. (*Peronea favillaceana*, Wilk.; Staint. *Acalla sponsana*, Mey.).—Occurs, but not commonly, at Northwood and Chalfont, always among beech.

PERONEA SCHALLERIANA, Linn. (*Peronea schalleriana*, Wilk.; Staint. *Acalla schalleriana*, Mey.).

PERONEA COMPARANA, Hübn. (*Peronea comparana*, Wilk.; Staint.).—This and the preceding are found at Mill Hill, Northwood, and Chalfont. They are probably only forms of one species. Intermediates have not been met with by myself in the area here dealt with, but my series from Macclesfield, where the insects are common, comprises all the intergrades between typical *schalleriana* and *comparana*.

PERONEA VARIEGANA, Schiff. (*Peronea variegana*, Wilk.; Staint. *Acalla variegana*, Mey.).—This variable species occurs throughout the whole area.

PERONEA ASPERSANA, Hübn. (*Paramesia aspersana*, Wilk.; Staint. *Acalla aspersana*, Mey.).—One or two each year at Northwood, but the species seems confined to one spot.

RHACODIA CAUDANA, Fabr. (*Teras caudana*, Wilk.; Staint. *Rhacodia caudana*, Mey.).—Occurs at Mill Hill and Northwood, but does not appear to be common in either locality. Wilkinson gives Caen Wood, near Hampstead.

TERAS CONTAMINANA, Hübn. (*Dictyopteryx contaminana*, Wilk.; Staint. *Acalla contaminana*, Mey.).—Common in almost every hedgerow. Varies in colour from pale drab through various shades of brown to fuscous.

DICTYOPTERYX LÆFLINGIANA, Linn.; Wilk.; Staint. (*Tortrix læflingiana*, Mey.).—Generally distributed, especially among oaks or in hedges under oaks.

DICTYOPTERYX HOLMIANA, Linn. (*Cræsia holmiana*, Wilk.; Staint. *Acalla holmiana*, Mey.).—Occurs in most hawthorn hedges, but appears to be most abundant at Mill Hill.

Dictyopteryx bergmanniana, Linn. (*Cræsia bergmanniana*, Wilk.; Staint. *Tortrix bergmanniana*, Mey.).—Common among roses, both wild and cultivated. To obtain really fine specimens it is better to rear this species from larvæ, which are easily obtained.

Dictyopteryx forskaleana, Linn. (*Cræsia forskaleana*, Wilk.; Staint. *Tortrix forskaleana*, Mey.).—Most maple bushes produce this species.

Ptycholoma lecheana, Linn.; Wilk.; Staint. (*Cacæcia lecheana*, Mey.).—Generally distributed. Sometimes flies rather high, in the early evening.

Ditula semifasciana, Haw. (*Brachytænia semifasciana*, Wilk.; Staint. *Eucosma semifasciana*, Mey.).—I took one example at Northwood in July; it was flying over a sallow bush which I was examining by lamplight.

Penthina corticana, Hübn. (*Antithesia corticana*, Wilk.; Staint. *Eucosma corticana*, Mey.).—Occurs at Northwood among birches.

Penthina betulæana, Haw. (*Antithesia betulæana*, Wilk.; Staint. *Eucosma betulæana*, Mey.).—Not uncommon among birches at Northwood.

Penthina capræana, Hübn. (*Antithesia capræana*, Wilk.; Staint. *Eucosma capræana*, Mey.).—Two specimens bred from sallow shoots obtained at Northwood.

Penthina sororculana, Zett. (*Antithesia prælongana*, Guen.; Wilk.; Staint. *Eucosma sororculana*, Mey.).—I have a note referring to the capture of this species at Northwood, but I cannot find the specimen.

Penthina pruniana, Hübn. (*Antithesia pruniana*, Wilk.; Staint. *Eucosma pruniana*, Mey.).—Common in hedgerows and also in gardens throughout the whole area.

Penthina ochroleucana, Hübn. (*Antithesia ochroleucana*, Wilk.; Staint. *Eucosma ochroleucana*, Mey.).—Occurs in most lanes, but most frequently met with at Mill Hill and Chalfont.

Penthina variegana, Hübn. (*Antithesia cynosbatella*, Wilk.; Staint. *Eucosma variegana*, Mey.).—Common everywhere.

Penthina sellana, Hübn. (*Antithesia sellana*, Wilk.; Staint. *Eucosma sellana*, Mey.).—I think this species occurs on the Midland Railway bank at Mill Hill.

Antithesia salicella, Linn. (*Penthina salicella*, Wilk.; Staint. *Eucosma salicella*, Mey.).—Occurs on willows and fences near Neasden.

Hedya ocellana, Fabr.; Wilk.; Staint. (*Tmetocera ocellana*, Mey.).—Generally distributed. I have taken a form closely approaching var. *hippophæana* in St. John's Wood.

HEDYA ACERIANA, Dup.; Wilk.; Staint. (*Gypsonoma aceriana*, Mey.).—Common on poplars in St. John's Wood, but I have not met with it in any other part of the area.

HEDYA DEALBANA, Fröl.; Wilk.; Staint. (*Gypsonoma dealbana*, Mey.).—Mill Hill, Northwood, and Chalfont; a variable and rather common species.

HEDYA NEGLECTANA, Dup.; Wilk.; Staint. (*Gypsonoma neglectana*, Mey.).—I obtained one example of this species at Northwood.

HEDYA SERVILLANA, Dup.; Wilk.; Staint. (*Laspeyresia servillana*, Mey.).—Northwood is the only locality that I know of. I have been unable to find larvæ, and I have only one example of the moth.

SPILONOTA TRIMACULANA, Haw.; Wilk.; Staint. (*Notocelia trimaculana*, Mey.).—Generally distributed; affects whitethorn hedges.

SPILONOTA ROSÆCOLANA, Doubl.; Wilk.; Staint. (*Notocelia rosæcolana*, Mey.).—Occurs in June and July among roses, and seems to be pretty generally distributed.

SPILONOTA ROBORANA, Tr.; Wilk.; Staint. (*Notocelia roborana*, Mey.).—Also a rose feeder in the larval state, and occurs in August in most localities throughout the area.

PARDIA TRIPUNCTANA, Fabr.; Wilk.; Staint. (*Epiblema tripunctana*, Mey.).—Generally distributed.

ASPIS UDMANNIANA, Linn. (*Notocelia udmanniana*, Wilk.; Staint.; Mey.).—Generally distributed and common, but most readily obtained by rearing the moths from caterpillars which dwell singly in large conspicuous packets of bramble leaves.

(To be continued.)

NOTES AND OBSERVATIONS.

CHRYSOPE PUNCTINERVIS, McLachlan.—The range of this interesting species in the west seems to be rather wide. On August 28th, 1894, I took specimens at light at San Augustine, New Mexico, at the eastern base of the Organ Mountains. As the insect was not described in Hagen's monograph of Neuroptera, I thought it probably new; but Mr. N. Banks kindly informed me that it was *C. punctinervis*, stating at the same time that he had specimens from Brownwood, Texas, and Fort Collins, Colorado. The only other *Chrysopa* I have positively identified from New Mexico is *C. externa*, Hagen, found on alfalfa at Las Cruces, June 8th, 1894. Several other species have been provisionally identified; but they are variable, and the material at hand is not sufficient for satisfactory conclusions.—T. D. A. COCKERELL; Mesilla Park, New Mexico, Feb. 20th, 1898.

HUMBLE-BEES IN NEW ZEALAND KILLED BY NATIVE BIRDS.—In vol. xxix. p. 210, of the 'Entomologist,' I referred briefly to some enemies of the introduced humble-bees in New Zealand. In the note referred to I also stated that we had observed the introduced starlings killing and conveying humble-bees to their nests to feed their young. In concluding the article I further stated that up to that time I had no records of native birds killing the bees. Recently, however, the tui or parson-bird (*Prothemadera nova-zealandiae*) has been detected killing them at Akaroa on Banks Peninsula. The case is remarkable in illustrating how new habits are acquired or family habits are developed in some species of birds when certain conditions are present. As the tui belongs to the starling family, and is one of the native honey-suckers, it is possible it also was killing humble-bees to feed its young when it discovered the honey-sac of the insects. The tui, while engaged in killing the bees, would discover their honey-sac, which would also lead to a continuance of the habit as a ready means of procuring their favourite food. An analogous case is also presented in some recently acquired habits of the starling. For two seasons I have observed what is undoubtedly an acquired taste and habit in the starling in New Zealand. Like the tui, it now frequents the flax-flats and sucks the honey from the richly mellifluous flowers. It is quite probable that the eating of the humble-bee's honey-sac by the starlings developed, or is now developing, the taste for honey in these birds. Owing to the three last successive seasons being extremely dry in the northern half of the Middle Island, there is a great scarcity of insect food, which probably impelled the birds to attack the humble-bees. In the newspaper report of the occurrence—which I am forwarding to the editor—it states that the humble-bees "are deprived of their honey-sac, the body of the insects being otherwise uninjured." In the interesting editorial footnote to my article (*l. c.* p. 212), Mr. Edward Saunders is quoted in reference to the great tom-tit (*Parus major*) killing humble-bees on lime trees. Mr. Saunders refers to the dead and dying insects as "having a large hole in the upper surface of the thorax, and another at the apex of the abdomen, the apical segments being removed." I have not seen Mr. Saunders's paper. But there seems to me no doubt that the tom-tit killed the humble-bees by extracting and consuming the viscera of the insects. It may possibly be considered that this subject is more ornithological than entomological. In my opinion honours are equal. The effects of environment on newly-introduced birds and insects presents a new field in which students of both sciences may readily observe the origin of new or acquired habits in their respective classes. Both the starling and tui are endowed with a high degree of intelligence, while anyone who has observed their habits knows their ready powers of perception. It would be interesting to know if any one of the three species of *Bombi* now acclimatised is more liable to attacks by the tui than the others. In some districts large areas of red clover (*Trifolium pratense*) are grown for seed, and are fertilised by two forms of *B. hortorum*. *B. terrestris* is, as it is in Europe, a destructive robber of many flowers in New Zealand. Unfortunately I live on the open Canterbury Plains, and far from the native bush where the tuis dwell, and have no opportunities of observing their habits in relation to the acclimatised *Bombi*.—W. W. SMITH; Ashburton, N.Z., Jan. 9th, 1898.

CNEPHASIA CINCTANA NOT AT BLOXWORTH.—A correspondent has lately called my attention to the inclusion of *Cnephasia cinctana* in my list of Lepidoptera taken at Bloxworth in 1895 (Entom. xxix. 132), and asks if this is correct. I am sorry to say it is not so. The species intended to be given was *C. sinuana*, which, by the printer's error (very probably occasioned by my bad writing), was made into *C. cinctana*. This last species has not, so far as I know, yet occurred in Dorsetshire; while *C. sinuana* is a rare though regularly occurring one. Not having had an opportunity to correct the press, and scarcely even running my eye over the paper after its appearance in due course in the 'Entomologist,' this error had quite escaped me, until my correspondent called my attention to it.—O. P. CAMBRIDGE; Bloxworth Rectory, Feb. 28th.

HELIOTHIS ARMIGERA, Hb.—In reference to Mr. South's interesting notes upon this species (*ante*, p. 17) and the other recent notices of its capture (*ante*, pp. 44, 45), it may not be without interest to state that there is a rather worn example in my cabinet, which was caught by my brother flying in the sunshine over the sandhills upon the coast, about four miles south of Berwick, in September, 1882. *H. armigera* has also been taken on two or three occasions in the neighbourhood of Burnmouth and Eyemouth, to the north of Berwick, by Mr. William Shaw.—GEORGE BOLAM; Berwick-on-Tweed, March 5th, 1898.

MELANIPPE TRISTATA, L.—Referring to the aberration of this species mentioned by Mr. W. F. de Vismes Kane (*ante*, p. 11), I may say that I have a somewhat similar example, taken on the Northumbrian moors last season, in which the black markings are decidedly paler than usual, and the light ground colour of all the wings has a pronounced rusty tinge.—GEORGE BOLAM.

THE RHOPALOCERA OF BIRMINGHAM AND DISTRICT.—I have been asked to make some corrections with regard to my notes on the above (*ante*, pp. 42-44). The majority of the species came under my own observation; but I have been obliged to refer to past literature for several to make the list as complete as possible. The records to which I referred were chiefly found in the 'Entomologist' and a local list of Lepidoptera; but as they are both between twenty and thirty years old they are now out of date, and several insects probably no longer occur in the district. For example: *Argynnis adippe* is recorded in the local list referred to, but locality not stated, and is certainly not known to have occurred in Sutton Park for many years; *Thecla quercus*, there is no authenticated record of its capture of late years in Sutton; *Lycana ægon* (*vide* Newman's Brit. Butt.) has not been seen in Sutton Park for many years past. I may add that my record of *Argynnis paphia* is the first really known capture of the species in the locality mentioned of late years, as I have since heard.—AUGUSTUS D. IMMS; "Linthurst," Oxford Road, Moseley, near Birmingham.

[We supposed that, except where otherwise noted, the species mentioned by our correspondent (*ante*, pp. 42-44) had been observed by himself. This appears not to have been the case, but, on the contrary, it would seem that he has incorporated ancient records, and this, too, without indicating where and when such records were published. It should not be necessary to point out that the usefulness of a local list

depends upon its accuracy; but as we are obliged to advert to the fact, we may further remark that one or two misleading entries in a list considerably reduce its value, even if they do not cause the whole compilation to be regarded as worthless.—ED.]

MIGRATION OF *ANOSIA PLEXIPPUS*.—At a meeting of the Cambridge Entomological Club (Mass., U.S.A.), the President, referring to a statement made in a recent work on British Butterflies, that there was not a "scintilla of actual evidence" to support the assertion that *Anosia plexippus* migrates southward in the autumn in North America, drew attention to the fact that three specific cases are noted by Riley in his third 'Missouri Report,' p. 151; and five others are reported in Scudder's 'Butterflies of the Eastern United States,' pp. 729, 730, 1083.—('Psyche' for March.)

NAPHTHALINE.—According to the experience of Mr. Eustace R. Bankes, as noted in the March number of the Ent. Mo. Mag., a moderate quantity of naphthaline is a useful thing to keep in cabinet drawers; but when used too liberally injury to the specimens is likely to ensue.

PIN-BLACKING.—I find that the preliminary processes mentioned in my former paper on this subject (Ent. Mo. Mag. vol. v., s.s., p. 252), namely, the soda-soak and rinse and the immersion in diluted nitric acid, are unnecessary, and that all that is required is to put the pins ("white") as purchased into a test-tube of suitable size, cover them with hydrosulphuric acid for a couple of minutes, and then pour off the liquid, and scatter the pins over a sheet of paper to dry. N.B.—When first turned out the pins are of a golden colour, but soon blacken on exposure to light and air. Pins prepared by this simple process possess great advantages over other black pins. Their surfaces are not liable to crack; their blackness is duller, and becomes intensified by age; they are less liable to the action of the vapour of butyric acid emitted by rancid grease; and, above all, the metal, particularly of the points, is considerably hardened. Surely for the attainment of so desirable a result the inconvenience of a few minutes' stink incurred in laying in a stock of pins of greatly improved quality, for a season or for several seasons, is hardly worth consideration.—H. G. KNAGGS; Folkestone, March, 1898.

GYNANDROMORPHOUS SPECIMEN OF *ADOPEA THAUMAS*, Hufn.—The reference to Leech's Butt. China, ante, p. 52, line 1, should have been "(p. 593, pl. xl., fig. 7, male)," and not as printed.

SPRING LEPIDOPTERA.—On March 12th last I found a specimen of *Panolis piniperda* at rest on a tree-trunk at Esher, and my friend Mr. B. Prest took a male example of *Amphidasys striataria (prodromaria)* in Kingston.—W. J. LUCAS; 21, Knights Park, Kingston-on-Thames.

TENIOCAMPA MUNDA IN THE AUTUMN.—Mr. John F. Churchill (Ent. Mo. Mag. s.s. ix. p. 65) records the capture of a small example of *T. munda* at ivy last autumn. This seems to be such an exceptional occurrence that we venture to ask if any of our readers have ever met with this species, or any other of the genus, in the autumn.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*March 2nd, 1898.*—Mr. G. H. Verrall, Vice-President, in the chair. The following were elected Fellows of the Society :—Miss Margaret Fountaine, 7, Lansdowne Place, Bath ; Mr. J. H. Carpenter, Shirley, St. James's Road, Sutton, Surrey ; Mr. G. O. Day, Parr's Bank House, Knutsford ; Mr. F. E. Filer, 58, Southwark Bridge Road, S.E. ; Mr. R. Hamlyn-Harris, The Conifers, Hambrook, Bristol ; Mr. E. J. Lewis, 4, Elwick Road, Ashford ; Mr. T. Maddison, South Bailey, Durham ; Mr. W. H. Mousley, Orchard House, Mundesley ; and Prof. Enzo Reuter, Helsingfors, Finland. Lord Walsingham exhibited a series of the larger and more striking species of Xyloryctinæ, a subfamily of the Gelechiidæ, especially characteristic of the Australian fauna. The series illustrated the life-histories and the great disparity in colour and form between the sexes of many species. He also gave an account of the family, chiefly from notes by Mr. Dodd of Queensland, with especial reference to the habits of the larvæ, which live in holes in tree-trunks, to which they drag leaves in the night for the next day's consumption. Mr. Gahan exhibited a locust, *Acridium ægyptium* (= *tartaricum*), taken in a house in Hanover Square, and probably imported in vegetables. Mr. Kirkaldy exhibited species of water-bugs, including *Enicocephalus culicis* and *Gerris robustus*, both taken for the first time in Mexico. A discussion arose on the reported occurrence of the San José scale, *Aspidiotus perniciosus*, in Great Britain. Mr. R. Newstead stated that during nine years' work on Coccidæ he had never once met with this species among scale-insects taken in this country and sent to him for identification. It was impossible even for an expert to distinguish it, without careful microscopical preparation and examination, from among the thirty or more known species of *Aspidiotus*, and any attempt to identify it on imported fruit by naked-eye observation, or with a hand-lens, was therefore quite impracticable. The risk of its distribution by being imported on fruit was small ; there was, however, much more likelihood of its introduction on plants. At the same time, he saw no reason to suppose that it would be more injurious in this country than the common *Mytilaspis pomorum* ; in America the San José scale had several generations in the year, sometimes as many as five, but in this country it would probably conform with the habits of all other scale-insects at present investigated, and become single-brooded.

March 16th.—Mr. R. McLachlan, F.R.S., Vice-President and Treasurer, in the chair. Mr. Champion exhibited specimens of *Acanthia inodora*, A. Dugès, from Guanajuato, Mexico. This insect, a congener with the common bed-bug, was found in fowl-houses, where it attacked poultry. Mr. Wainwright exhibited a locust found alive in broccoli at Birmingham. The insect was identified by Mr. Burr as *Acridium ægyptium*. Mr. Tutt showed a series of captured examples of *Calligenia miniata*, varying in colour and the amount of black markings, one example being a clear yellow and another orange. The Secretary exhibited part of a series of holograph letters, &c., which he had discovered among old papers in the Society's Library, including communications from Kirby, Spence, Darwin, Hope, Yarrell, and many other

entomologists. A paper by Mr. E. E. Green, of Punduluoya, Ceylon, entitled "Further notes on *Dyscritina*, Westwood," was read, and illustrated by specimens and drawings. The author had discovered two distinct species of *Dyscritina*, which he was able to keep in captivity, and rear from the early larval stage to that of the imago. The characteristic abdominal cerci increased in length with successive moults, until in *D. longisetosa* they became much larger than the body. In the penultimate stadium they were lost without a moult, being probably bitten off by the possessor, the long basal joints alone remaining. The imago was a typical earwig, the forceps being developed within the basal joints of the cerci. Sensory organs on the antennæ and palpi were described, as well as the habits of both species. In the ensuing discussion Mr. M. Burr referred the imagos to the genus *Diplatys*, that of Mr. Green's new form being, he believed, a known species. The genus *Dyscritina* must therefore be sunk. Mr. Gahan observed that the fact of the forceps being developed within the basal joints of the cerci alone did not prove that they were not homologous with the entire cerci; perhaps the internal structure of the latter was retracted by a histolytic process before amputation. In *Forficula* he had found evident traces of meristic division in the forceps of embryos which were nearly on the point of hatching. Dr. Chapman read a paper entitled "Some remarks on *Heterogyna penella*," giving a full account of its life-history. The female was destitute of all appendages whatever, and only left the pupal case for pairing, returning within it ten minutes later. It possessed an organic connection with the pupal case in the situation of the legs. The larvæ were hatched within the case, and devoured the remains of the mother. On anatomical characters he assigned to the insect a place near the *Zygænidæ*.—W. F. H. BLANDFORD, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 24th, 1898.*—Mr. J. W. Tutt, F.E.S., President, in the chair. Mr. Kaye, Worcester Park, Surrey, and Mr. Chatterton, F.E.S., 7, Clissold Road, Stoke Newington, were elected members. Mr. S. Stevens exhibited several fine varieties of Lasiocampid moths, including bright yellow-brown *B. trifolii*, *B. quercus* with semitransparent hind wings, a dark well-banded *B. rubi*, and a remarkably light *L. quercifolia*. Mr. J. A. Clarke, a series of the Lasiocampidæ, including many fine and extreme forms of variation. Mr. R. Adkin, fine series and varieties of many of the same family. Mr. Tutt, an inbred series of *Zygæna filipendula*, showing the gradual coalescence of the spots and the usual order of this joining; a *Brephos parthenias* from Leicester, having yellow hind wings; and a yellow variety of *Arctia fuliginosa*. Mr. F. Clarke, photomicrographs of the curious scales of the aberrant Lepidopteron *Pseudopontia paradoxa*. Mr. Tutt read a paper entitled "The Lasiocampid Moths," illustrating it with specimens, diagrams, and the blackboard. A discussion ensued, Dr. Chapman, Messrs. J. A. Clarke, R. Adkin, S. Stevens, Hillsworth, McArthur, and Tutt taking part.

March 10th.—Mr. J. W. Tutt, F.E.S., President, in the chair. Mr. Donisthorpe, F.E.S., 73, W. Cornwall Road; Mr. F. Bouskell, F.E.S., Leicester; Mr. F. Lemann, F.E.S., Plymouth; Mr. Parkin, Battersea; and Mr. Bevins, Clapham Common, were elected members.

The evening was devoted to the exhibition of a large number of admirable photomicrographs made by Mr. Fred Clarke; together with a number of slides showing details of the *Odonata* (dragonflies) made by Mr. Lucas. The slides were of particular interest, as the objects were chosen in many cases by other members and handed to Mr. Clarke, who photographed and most skilfully manipulated them for exhibition in the Society's lantern.—HY. J. TURNER (*Hon. Rep. Sec.*).

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*February 21st, 1898.*—Mr. G. T. Bethune-Baker, President, in the chair. Mr. R. C. Bradley showed *Capua flavillaceana*, which had been common in Sutton Park last year, though in previous years he had only seen occasional specimens. Mr. P. W. Abbott, a very fine and well marked series of Cornish *Lycena arion*; also *Gnophos obscuraria* from Lewis, with var. *calceolaria* and an intermediate form. Mr. Bethune-Baker, two drawers full of the genus *Colias*.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

OBITUARY.

JOHN N. YOUNG died somewhat suddenly on Feb. 13th last, at his residence in Rotherham. He was born in Lincolnshire, and as a young man spent several years in London. Between thirty and forty years ago Messrs. Guest and Chrimes acquired a branch of trade with which the late Mr. Farindon Lane was associated, and when he removed from London to Rotherham, Mr. Young, who was then one of his workmen, went with him, and thenceforth continued with the firm until disabled by his last illness, which was of a lingering character. Mr. Young delighted to spend his leisure hours in the woods and fields, and his wide knowledge of natural history was acquired by patient observation and practical acquaintance with the objects themselves. As an instance of the enthusiastic way in which he carried on his entomological work, it may be mentioned that he frequently walked some ten miles or more to a favourite wood or other collecting ground, where he would spend the night and then tramp home again the next morning. He was elected a member of the South London Entomological and Natural History Society in 1888, and he had an extensive circle of entomological friends, by all of whom he was esteemed as a warm-hearted and liberal correspondent.

JOHN WILLIAM SHIPP died at 117, Cowley Road, Oxford, on Feb. 15th last, aged twenty-four years. From his boyhood Mr. Shipp was greatly interested in the study of natural history, and left the teaching profession to become assistant to the late Prof. Westwood, who held a high opinion of him as an entomologist. After the death of Prof. Westwood he had charge of the Zoological Department of the Oxford University Museum until the appointment of Prof. Poulton. Subsequently he was engaged on entomological work in the Hon. Walter Rothschild's museum at Tring. As a practical entomologist he was both expert and assiduous, and his published papers on *Coleoptera*, &c. (*Entom.* vols. xxvi.—xxx.) afford evidence of his ability in literary research, and also show that he was admirably qualified to deal with his subjects scientifically. His early death is much to be deplored.

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[No. 420.]

NOTES ON AQUATIC RHYNCHOTA.—No. 2.

By G. W. KIRKALDY.

1. *Brachymetra bakeri*, Kirk., n. sp.

Apterous form.—First antennal segment *four* times as long as the second. Second rostral segment extending *beyond* the apex of the mesosternum; third segment very short. Anterior femora *cylindrical*, incrassate, shorter than the whole length of the insect (from head to apex of abdomen), one-fourteenth longer than the tibiæ, which are five-sixths longer than the tarsi, first tarsal segment one-fourth longer than the second. Intermediate and posterior femora subequal; intermediate femora two-thirds longer than the tibiæ, which are about *five* times as long as the tarsi. Abdominal segments simple. Long. 13 mm. ♀. Colombia (*C. F. Baker*); my collection.

Head, first antennal segment, first and second rostral segments, pronotum, anterior femora, intermediate and posterior legs rufo-castaneous; anterior tibiæ and tarsi nigro-castaneous. Second antennal segment, metanotum and dorsum of abdomen blackish; third and apex of second rostral segments pitch-black (all these parts are more or less covered with short, rather coarse hair). Prosternum pale castaneous; mesonotum, mesosternum, and venter of abdomen with short, dense pubescence, silvery-white on the mesonotum, lilac-grey on the mesosternum, and slightly redder in tint on the venter of abdomen.

I am indebted to Prof. Carl F. Baker for sending me this species, and permitting me to retain the unique specimen for my own collection. It may be readily separated from *B. albinervus* (Am. Serv.) by the following characters:—

Length 6-7½ mm., first antennal segment twice as long as second; anterior femora incrassate, compressed, laterally dilated, one-sixth longer than tibiæ, which are two and a quarter times as long as tarsi; ventral surface covered with pale yellowish pubescence. (Brazil, Grenada, St. Vincent, &c.) - - - 1. *albinervus* (Am. Serv.).

Length 13 mm., first antennal segment four times as long as second; anterior femora incrassate, cylindrical, one-fourteenth longer than tibiae, which are five-sixths longer than tarsi; ventral surface covered with lilac-grey pubescence. (Colombia.) - 2. *bakeri*, Kirk.

The introduction of this new species necessitates some modification of Mayr's generic diagnosis (Verh. Ges. Wien, 1865, p. 445; and Novara Exped., Hem., p. 178). The description of the antennæ and the mention of the length-equality of the anterior tarsal segments must be removed to the specific diagnosis of *B. albinervus*.

It is difficult to state a generic diagnosis that will succinctly distinguish *Brachymetra* from the other Halobatinæ. Bianchi gives the following characters (Ann. Mus. Zool. Petersb. 1896, p. 71):—First antennal segment shorter than the other three together, fourth not longer than third; anterior tarsal segments subequal; intermediate and posterior tibiae and tarsi not ciliate. The last character eliminates *Halobates*, Eschsch.

Unfortunately the third and fourth segments of the only remaining antenna are missing in *B. bakeri*; but, as the first segment is four times as long as the second, I doubt very much the stability of Bianchi's first character (shown in Mayr's excellent figure of *B. albinervus*). The anterior tarsal segments in *B. bakeri* are, as shown above, distinctly unequal.

The other Halobatine genera differ as follows:—*Hermatobates*, Carp., is at once distinguished by the greatly incrassate and laterally-dilated anterior femora, and by the trisegmentate tarsi; in *Metrobates*, Uhl., and *Platygerris*, F. B. White, the first segment of the anterior tarsi is very much shorter than the second; while in *Potamometra*, Bianchi, *Trepobates*, Uhl., and *Chimarhometra*, Bianchi, it is much longer; moreover the anterior femora of *Trepobates* are not incrassate.

The nearest ally, *Metrocoris*, Mayr, has the anterior margin of the pronotum strongly excavated, the basal process of the pronotum triangularly produced (not rounded), and the first segment of the anterior tarsi much shorter than the second.

Having regard to the specific variation in the proportions of the antennæ in the extensive genus *Gerris*, Fabr., it would seem well not to base other genera of the Hydrometridæ principally upon such proportions.

The length of the abdomen in *Brachymetra* (in both species the length of the head and pronotum combined is subequal to that of the abdomen) gives this genus a general aspect very different from most of the other genera of the Halobatinæ, approaching in this respect the Gerrinæ.

2. GERRIS, Fabr.

In the third volume of Lethierry and Severin's Catalogue, *Gerris* is used as if it were feminine. It is presumably derived

from the Latin masculine word "gerres" (a small kind of pickled fish of inferior quality). Fabricius, the author of the genus, employed it as a masculine word; but, without exception (I think), modern writers have treated it as feminine. These remarks apply also to its hybrid derivation *Platygeris*, F. B. White, with its single species *P. depressus*.

3. *Æpophilus bonnairei*, Sign.

In his charming 'Natural History of Aquatic Insects,' Prof. Miall writes (p. 380) that the adult *Æpophilus* is "found only in the month of October." Assured that this was a mistake, I wrote to Mr. Keys, who replied: "I have taken the mature *Æpophilus* in February, March, April, May, June, July, and August. I dare say it occurs therefore all the year round . . . I have taken the greatest number at a time in May." Has anyone taken macropterous examples?

4. I have made an unfortunate mistake with regard to Say's New Harmony paper, stating that no copy apparently existed (*ante*, p. 2). My friend Prof. Uhler writes me that two copies of this exceedingly scarce paper exist: one (that from which Dr. Fitch reprinted in 1858) is now in the Library of the Boston Society of Natural History; the other is in Prof. Uhler's Library. The exact title of this thirty-nine-page pamphlet is 'Descriptions of New Species of Heteropterous Hemiptera of North America. By Thomas Say. New Harmony, Indiana. December, 1831.' It would be interesting to know if any copies exist in Europe now.

MICRO-LEPIDOPTERA TAKEN AT BLOXWORTH, DORSET.

By REV. O. PICKARD-CAMBRIDGE, M.A., F.R.S.

THIS list was drawn up at the end of the season of 1896, put aside, overlooked, and then, in spite of every effort to find it, quite lost sight of until a few days since. If, however, it is thought worth inserting in the 'Entomologist' thus late in the day, it will show that the season of 1896 was not so barren a one here as I believe it proved, chiefly owing to drought, in many other localities.

As regards the sequence of species in the list, I may observe that no systematic arrangement is intended.

Sophronia parentheses.—Fairly frequent at the middle of July on one spot on the heath.

Aciptilia paludum.—In its old locality very abundant on two evenings (Aug. 4th and 5th), on which I caught forty-seven specimens, but scarcely to be found afterwards; all were in the finest condition.

This interesting little "plume" seems to defy all attempts to discover its life-history.

Penthina ochroleucana.—A few on Scotch-rose bushes near my front door. I have taken it on these now for some years past, but never anywhere else.

Peronea rufana.—Very occasionally, amongst salallows in a swamp.

Nematois minimellus.—Not rare in open places in woods among scabious (*Scabiosa succisa*), but as they must be swept for, their condition is seldom very fine.

Cleodora cytisella.—Abundant among fern (common bracken), but, for the same reason as just given in respect to the last species, only one now and then in fine condition.

Elachista monticola.—Abundant in a swamp; one or two as early as June, but chiefly in August and early September.

Cosmopteryx orichalcella.—Very abundant on one heath-bog, by sweeping and brushing. As the result of two or three strokes I had once over forty in my net at the same moment; these, as they danced up the inside of the net, with the setting sun shining full upon them, formed one of the most brilliant sights, in a small way, that I have ever seen. Even with the greatest care and watchfulness I could never detect this lovely little moth on the wing, and only twice spotted it at rest on a rush-stem.

Laverna decorella.—Not infrequent on whitethorn.

L. lacteella.—Scarcer than I have yet seen it since it was first found here some years ago.

Æcophora lambdella.—Occasional among old and dead furze-bushes.

Pancalia lewenhoekella.—Occasional on one or two widely separated spots.

Cerostoma horridella.—Very rare; only two or three specimens.

C. lucella.—Scarce; the old bushes which used in former seasons rarely to fail, hardly afforded any.

Zelleria insignipella.—Two or three well-marked specimens of this form, which, I believe, is now considered to be only *Z. hepariella* var.

Eupeccilia geyreriana.—Evidently had been abundant, but I was too late for it in very good condition.

Phoxopteryx siculana.—Occasional.

P. biarcuana.—Frequent.

P. inornatana.—Abundant.

Cedestis farinatella.—Occasional on Scotch firs.

Pædisca bilunana.—Occasional on birch.

Chauliodes illigerellus.—Abundant in damp wood-paths, open and swampy places.

C. chærophyllellus.—Very scarce.

Enectra pilleriana.—Rare.

Brachmia mouffetella.—Two specimens in orchard.

Bryotropha mundella.—For the first time, on Bloxworth Heath. This form is not rare at Portland, under sandy and rocky ledges along the Chesil beach.

Eupithecia linariata.—Two or three on wing, and several larvæ on yellow toadflax.

E. centaureata.—Occasional.

E. coronata.—Very scarce.

Carpocapsa splendana.—Bred from acorns, and also beaten out of underwood.

Nannodia naviferella (*stipella*).—Rather abundant by brushing along among herbage under hedges.

Gracilaria tringipennella.—Two specimens; this is a very scarce species in this district.

Gastropacha quercifolia.—One specimen, apparently only just out of the pupa, beat from a stunted thorn-bush on a bare down. This is only the second specimen taken here during many years.

Ecophora minutella.—One specimen on the window in my sitting-room.

Mixodia ratsburgiana.—Not infrequent on spruce firs about the middle of August, but mostly rather worn.

Elachista perplexella.—Several examples on a heath-bog, at the end of May and beginning of June.

A CATALOGUE OF THE LEPIDOPTERA OF IRELAND.

By W. F. DE VISMES KANE, M.A., M.R.I.A., F.E.S.

(Continued from p. 88.)

CIDARIA SILACEATA, *Hb.*—Local and occasionally numerous, but with a wide distribution, though I have no southern records. Variation in three principal directions is observable, namely, the breadth of the median band; its being broken into two portions by the connection of the parallel pale bands by either one or two streaks across its area; and the white ground colour of the hind marginal area of the wing being richly tinted with yellow. I have not seen any examples of the first of Newman's figures, which has a pale portion in the centre of the median band. Abundant at Clonbrock, Co. Galway; also at Markree Castle, scarce at Rockwood, Co. Sligo; scarce near Enniskillen (*Part-ridge*) and Strabane (*C.*); abundant at Favour Royal, Co. Tyrone; and at Collin Glen, Belfast (*W.*); Farnham, Cavan; Killynon, not rare, Co. Westmeath.

CIDARIA PRUNATA, *L.*—I know very little of the range of this species. I have only met with it about gardens, never in woodlands, and have found it generally scarce. It would, therefore, appear that it is restricted to currant and gooseberry as food-plants. Kingstown, in some numbers; Derry, abundant (*C.*); Armagh (*J.*); Killynon, Co. Westmeath (*Miss R.*).

CIDARIA TESTATA, *L.*—Very common on the sides of mountains throughout Ireland. Irish specimens are, by some collectors, considered often to vary from the usual British type by having a more purple tint.

CIDARIA POPULATA, *L.*—Extremely common in ancient woodlands. Varies in strength of colour of the median band, as well

as the brightness of the general ground colour, which sometimes is similar to *C. dotata*. - I have not met with the var. *musauaria*, Frr., which is taken at Rannoch.

CIDARIA FULVATA, Forst.—Abundant where found, but apparently very local in Ireland. Kingstown; Ardahan and Clonbrock, Co. Galway (*R. E. D.*); Killynon, Westmeath (*Miss R.*); Armagh (*J.*); Derry (*C.*); Favour Royal, Tyrone; Minehead, Co. Waterford.

CIDARIA DOTATA, L.—More generally found on the coast than inland, and widely distributed; sometimes abundant. Powerscourt (*B.*) and Greystones, Co. Wicklow; Howth (*B.*) and Malahide, Co. Dublin; Rathangan and Athy, Co. Kildare; Minehead, Co. Waterford; Killynon (*Miss R.*); near Sligo, abundant; Inver, ditto, Co. Donegal; Magilligan, ditto, Co. Derry, very abundant; Ardahan and Clonbrock, scarce, Co. Galway.

[*CIDARIA ASSOCIATA*, Bork.—I am extremely doubtful if this insect occurs in Ireland. Birchall gives Cork, Kingstown, and Powerscourt. Mr. Campbell states that it is abundant at Magilligan; but I question if the synonymy has not led to an error, as the preceding species is very numerous there; but I have not seen a specimen of *associata* from the locality. It is wiser to omit this species till its occurrence is definitely established.]

PELURGA COMITATA, L.—Like *C. dotata* this is a coast-loving species, though found also inland. This is probably owing to the perennial abundance of its food-plant on the beaches, undisturbed by the plough. It is very widely spread, and without being very common anywhere is frequently met with. Howth, common (*B.*), coast of Wicklow; Minehead and Dromana, Co. Waterford; at many places on the coast of Cork; Dingle, Kerry; Sligo (*Russ*) and Markree Castle; Coolmore and Stranorlar, Co. Donegal; Dalyston near Loughrea and Clonbrock, Co. Galway; Killynon, Co. Westmeath; Tempo Manor, abundant (*Langham*); Belleisle, Co. Fermanagh; also Co. Tyrone and Cavan, &c.

EUBOLIA CERVINATA, Schiff.—Numerous at Howth and Sutton, Co. Dublin; Greystones, Co. Wicklow; Castle Bellingham (*Thornhill*); Rossbeigh, abundant, Co. Kerry; Mallow, Co. Cork (*Stawell*); Sligo.

EUBOLIA LIMITATA, Scop.—A very common Geometer everywhere. Varies considerably in the depth of colour.

EUBOLIA PLUMBARIA, Fb.—Very common. It varies considerably, the ground being sometimes a warm grey, but occasionally whitish grey; also the lines bounding the median band are sometimes slight and ferruginous, and sometimes a dark brown and suffused over the band.

MESOTYPE VIRGATA, *Rott.*—At a considerable elevation on Mangerton Mount near Killarney (*B.*); and at Newcastle, Co. Down (*Bw.*).

CARSIA PALUDATA, *Thnb.*—Var. *imbutata*, *Hb.* Birchall gives Howth as a locality on the authority of Mr. Shield; but the food-plant is not at present found there, nor a suitable marshy habitat; and I should doubt the statement. The moth, however, exists on the bogs bordering the Shannon near Banagher, and thence to Ballinasloe; but it is difficult to meet with, being scarce. Some twelve miles further west, at Clonbrock, the Hon. R. E. Dillon has taken two. The food-plant is, however, fairly abundant in extensive bogs in that neighbourhood, not yet examined at the proper season. At Killynon, Westmeath, Miss Reynell has taken two specimens. Doubtless the species exists in many of the Irish bogs. My series is more handsomely marked than the usual Lancashire specimens, and far richer in colour than two I have from Scandinavia, labelled by Sven Lampa var. *sororiata* and var. *obscurata* respectively. The former seems to be the form described by Staudinger as "forma dilutior, cinerascens, magis unicolor." It is of a dingy grey, marked with rather washed-out fuscous bands, and has no reddish tint. The latter, *obscurata*, is a darker brownish grey insect, with costal traces of the bands, the outer one more continuously indicated by a pale sinuous line, and near the apex there is a flush of ferruginous. Neither specimen would be easily identified by anyone accustomed to our strongly-marked form, which belongs to the var. *imbutata*.

ANAITIS PLAGIATA, *L.*—Widely spread, and locally abundant. The two dark bands which traverse the centre of the wing sometimes coalesce about mid-wing. They are also variable in depth of marking, sometimes being very dark. The burnt sienna flush near the apex of some specimens is very rich, while in others it fails entirely.

CHESIAS SPARTIATA, *Fues.*—Apparently has been overlooked by collectors. Near Derry, abundant (*C.*); on the slopes of Slieve Beagh Mt., Co. Monaghan. I have also beaten the larvæ elsewhere, but have forgotten the localities.

TANAGRA ATRATA, *L.*—Local, but there plentiful. Widely distributed. Kylemore (*Hon. E. L.*), Clonbrock, Glendalough (*Miss R.*), Ardrahan, &c., Co. Galway; Markree Castle, Co. Sligo; Belleek (*J.*) and Tempo (*Langham*), Co. Fermanagh; Cromlyn (*Mrs. B.*), Co. Westmeath; Stranolar, Co. Donegal; Ennis, Co. Clare; Tramore, Co. Waterford; &c.

(To be continued.)

NOTES ON LEPIDOPTERA FROM THE MEDITERRANEAN.

By Fleet-Paymaster GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

(Concluded from p. 84.)

We left Malta on April 1st, arrived at Ville Franche, near Nice, on the 4th, and remained there until the 28th, as guard-ship to the Queen during her visit to Cimiez. The town is situated on the slopes of steep hills at the head of a lovely bay, and above it are numerous pretty villas nestling among a profusion of olive, orange, poplar, carob, and other trees, and most of them are surrounded by delightful gardens. Above these there are patches of open ground covered with rough boulders, amongst which a variety of aromatic shrubs were growing and flowering in the wildest luxuriance, and beyond this, again, up to their summits, the hills were clothed with sweet-smelling pines. Everyone knows or has read of the beautiful Riviera, so I will not take up your space with an attempt to describe the lovely scenery. I must, however, just say that from one of the highest points above Ville Franche—Mont Vinaigrier—one can obtain a most magnificent view of Nice and the surrounding country. My collecting expeditions were chiefly confined to this open ground between the highest villas and the belt of pine wood, and to some open spots among the villas between Ville Franche and Beaulieu. I also made one or two excursions farther away to the slopes near the upper Corniche road.

On April 5th I met with *P. rapæ*, *P. brassicæ*, *C. edusa*, and *C. pamphilus* in abundance, and took or saw several examples of *P. podalirius* (worn), *G. c-album*, *P. daphidice*, *P. atalanta*, *P. cardui*, *G. cleopatra*, *L. megæra*, *L. argiolus*, *L. baton* var. *panoptes*. *Pyrausta punicealis* was common among wild thyme, and *Rhodaria sanguinalis* abundant among sun-cistus and wild sage. On the 10th I went with a picnic party to visit Eze, a very ancient village perched on the summit of a lofty rock at the head of a deep gorge. It is some 1600 feet above the sea-level, and commands a splendid view. From Eze station the path, not much better than a donkey-track, winds in a zigzag fashion up the ravine, and was steep and difficult in some places. The sides of the gorge were clothed with olive and pine trees, and when we got higher up we met with ash, poplar, ilex, mountain-ash, willow, &c. Bushes of some kind of *Genista* were thickly covered with their pretty yellow flowers, and various kinds of *Euphorbia*, some large and bushy, were also clothed in their greenish-yellow bloom. Upon one of these I was surprised to see a fine specimen of *Panolis piniperda* enjoying itself, and a little farther on I took *Agrotis puta*. No fresh butterflies were seen that day, except one small *Argynnis*, which was probably

euphrosyne. It took us some little time getting up to the village, and several halts were made on the way for the purpose of admiring the scenery; but when at last we reached the top we were amply repaid for our climb. At one period the village was evidently well fortified, probably when it was inhabited, some centuries ago, by the Knights of Malta. Above the village, upon the highest point of rock, stand the ruins of a castle, and the view from here is simply superb. We had our picnic in a little meadow off the track, about a quarter of a mile below the village. It was a most romantic spot, and the long climb and invigorating air had given us all keen appetites.

On the 12th I noticed the first *P. machaon*, and by the 17th they were out commonly, and were joined by *Anthocharis cardamines*, *A. euphenoides*, *P. mæra*, *L. icarus*, and *C. phlæas*, and on this day I took the only specimen of *Thecla rubi* seen during our stay at Ville Franche. *Cidaria* sp.?, *Campptogramma bilineata*, *Minoa euphorbiata*, and *Mecyna polygonalis* (1) were taken by beating. On 19th *P. egeria* and *Spilothyrus alceæ* were added to the list, but nothing fresh was noticed after this date. Nests of the larvæ of *Cnethocampa* were plentiful on the pines. If we had remained here for another month a great many more species would doubtless have been taken, and I should say from the appearance of the country that Lepidoptera would be abundant during May and June.

We arrived at Suda Bay, Crete, on May 2nd, and remained on the coast of that island, principally at Canea, until July 6th. All the time we were there the country was in such a disturbed condition that our admiral gave orders that no officers were to go alone outside the town, but were to be in parties of not less than two or three together, to be in uniform, and armed with revolvers, and on no account were they to pass the cordon of international troops, which extended from two to three miles beyond the town. This made collecting rather a trying matter, for it is no easy thing to run after a butterfly in a blazing hot sun, with a revolver-belt round one's wrist, and with a closely-fitting tunic buttoned up to one's throat, not to mention the absence of voluminous pockets for the stowage of glass-bottomed boxes, &c.

Canea, which is one of the largest towns in Crete, is situated at the corner of a wide bay facing the north. It is irregularly built, and the streets are narrow, dirty, and badly paved. It is enclosed by old walls and fortifications, with a bastion and ditch on the land side, the work of the Venetians. Beyond the town there is an extensive plain, which stretches away to the foot of the lower slopes of the range of lofty mountains which run from east to west throughout the island. It is very fertile, and contains vineyards and olive-gardens, and a large quantity of corn, maize, melons, garden produce, &c., is usually cultivated. Owing, however, to the unhappy state of the country, many of the

fields were lying fallow, vineyards were neglected, olive-trees had been cut down, and farm-houses burnt by the insurgents or the Mahomedans.

On May 12th we left Canea and proceeded to Platania, a small village about six miles to the westward, to assist at and superintend the embarkation of the Greek troops who were leaving the island. We remained there until the 27th. About a mile and a half off Platania there is a small rocky island called Theodore Island. It is about half a mile long by a quarter broad, is hilly, very rough, the ground being covered with blocks of volcanic tufa, between which there was an abundance of vegetation, consisting of two kinds of stunted and very prickly bushes, the names of which I do not know, wild sage, thyme, peppermint, bramble, many bulbous plants, various grasses, &c. I landed on it several times and found the pretty little *Cænonympha thyrsis*, which is peculiar to Crete, in the greatest abundance, indeed they were so plentiful on flowers of peppermint that I frequently had six or seven in my net together. Besides these I noticed *P. machaon*, *P. daplidice*, *P. megæra*, *Satyrus semele*, *S. alceæ*, *M. stellatarum*, and several *Acontia solaris*. A pretty *Phycis* was also extremely numerous.

During June, in the neighbourhood of Canea and Suda Bay, I took the following:—

Papilio machaon.—Common; larvæ on fennel.

Papilio podalirius.—Common; larvæ on fennel.

Pieris rapæ.—Black blotch at tip of fore wings large and distinct; scarcely any black at base of wings; under side of hind wings very pale greenish white, almost white in fact.

Pieris brassicæ.—Only one seen.

Leucophasia sinapis var. *diniensis*.—Three examples.

Colias edusa.—Common.

Polyommatus phlæas.—A few, rather large and dark.

Lycæna astrarche.—Common and typical, but small.

Lycæna icarus.—Abundant. A remarkably small race; some of the females, which are dark brown without any blue, are only five-eighths of an inch across the wings, and the males have the spots and markings beneath very small and obscure. The comparison between this race and the form taken a month later at Malta is very great.

Lycæna argiolus.—Common, flying over bramble-blossom. Females fine, and strongly marked.

Vanessa egea.—Not uncommon. Generally found near habitations, and fond of alighting on walls.

Pyrameis atalanta.—A few, but rather a stunted race.

Vanessa cardui.—Abundant.

Satyrus semele var. *aristæus*.—First seen on June 12th; rather uncommon, and difficult to catch. Females very fine and large, expanding $2\frac{1}{2}$ inches across the wings.

Pararge megæra.—Abundant.

Pararge egeria.—Abundant.

Epinephela lycaon.—Common. First observed June 10th. Found on waste uncultivated places. They do not fly much, and are fond of settling under banks, or on the shady sides of boulders or walls. The males with their wings closed are very like *E. ianira*. The females are not so numerous as the males.

E. ianira var. *hispulla*.—Abundant. Haunt shady lanes, where I have beat them from bramble and other bushes. The females were more common than the males, were fine large examples, and some of them varied a good deal beneath.

Canonympha thyrsis.—Common in waste places among wild thyme, &c., but nothing like so abundant as it was on Theodore Island.

Spilothyrus alcea.—Common.

Syrichthus malva.—One specimen.

Hesperia actæon.—Abundant.

Hesperia nostrodamus.—One or two.

Deilephila euphorbia.—Several observed at night, flying in front of our electric lights.

Macroglossa stellatarum.—Common.

Callimorpha hera.—One at rest.

Catocala sp. ?—One at rest.

Camptogramma bilineata, *Acidalia ornata*, *Sterrhæa succharia*, *Anaitis* sp. ?, and several undetermined species of *Geometra*, were beaten from hedges; *Scopula ferrugalis*, *Crambus chrysonuchellus*, and another species of *Crambus*, were common among rushes.

This is rather a poor list, and I was disappointed at not getting more. No doubt, had I been able to go for any distance inland, or up the mountains, I should have obtained a number of interesting species, for, as far as one could see, the country looked most promising.

We left Crete on July 6th, and arrived at Malta on the 8th, and remained there until Aug. 2nd, when we sailed with the fleet for a delightful cruise up the Adriatic. Our first place of call was Corfu, where we arrived on the 4th. This is a charming island, and looks a perfect place for collecting in. There are so many lovely walks, all among gardens and vineyards and olive-groves, and the country is so diversified—mountains and plains, open slopes, wooded gorges, and marshy places. I should much like to visit it during May and June. We remained until the 12th, and stopped again on our way back from Sept. 21st until the 28th. I will give a list of the Lepidoptera I met with, omitting such common species as *P. rapæ*, *P. brassicæ*, *Pyrameis cardui*, &c., and will not mention these for the future in any other list, except there is anything peculiar about them which may call for a remark.

Papilio podalirius and *P. machaon*.—Both common.

Pieris daphidice.—Both common.

Leucophasia sinapis var. *diniensis*.—The most abundant species, met with by roadsides, in olive-gardens, &c. These, of course, were a second or third brood. This is a favourite of mine, and I like to watch its gentle airy flight, as it flutters to and fro amongst the

thickest undergrowth where, strange to say, it seldom injures its delicate wings.

Colias edusa var. *helice*.—Two specimens.

Rhodocera cleopatra.—One male.

Polyommatus phlaeas var. *eleus*.—A few.

Lycana telicanus.—Several.

Lycana argiolus.—Common about bramble. Females were depositing their eggs upon terminal shoots and small unripe fruit.

Limenitis camilla.—One fine male. This, of course, must have been a second brood.

Vanessa egea.—Common, but the specimens were small.

Melitæa didyma.—Common, and the females vary a good deal, and some of the varieties are very interesting. A second or third brood.

Argynnis paphia.—Several seen, and one taken on August 11th, late in the afternoon, when they were retiring for the night among ivy-leaves growing on trees in a gloomy little covert in the King's Park.

Satyrus hermione.—Common, but difficult to catch. They are fond of sitting upon the trunks of olive-trees, and an old tree with a hollow trunk is a favourite place. As one passes they dash out, but do not fly far, generally pitching again on the next tree; but they are very wary, and have to be approached with great caution. There were more females than males.

Satyrus semele var. *aristæus*.—This species puzzled me a good deal at first. *Semele*, as we know it in England, delights in the sun, occurs in heathy localities, and upon downs near the sea, and when disturbed usually settles upon a stone, or upon a bare patch of ground. These were found sitting upon the trunks of trees in shady places, generally high up, were very wary, and flew off at the least noise, and then settled upon the under side of a branch higher up and quite out of reach. It was some time before I succeeded in capturing one, and then I could not quite make out what I had got. Two or three that I disturbed flew into some thick covert, and upon following them I discovered a good many sitting upon ivy-covered trees, upon the trunks, under the branches, and upon the leaves. It was very dark and gloomy, and not a place where one would expect to find such a sun-loving species as *semele*. Nevertheless it seemed to be their headquarters, and I soon caught fourteen or fifteen of them, and might have taken more had I wished to do so. They were nearly all females, and large examples, very dark, and in fine condition, the females averaging $2\frac{1}{2}$ inches across the wings.

Pararge roxelana.—A few, but in poor condition. Habits similar to those of *S. hermione*.

Pararge egeria and *egerides*.—Common in the King's Park.

Epinephele ianira var. *hispulla*.—Common, but rather darker than specimens from Crete or Malta. Was still on the wing on Sept. 27th.

Epinephele ida.—A few, but mostly worn.

Cænonympha pamphilus var. —A very interesting dark form. This may be a distinct species.

Spilothyris alcea.—Common.

Syrichtus proto.—Six examples only, on Vido, a small island lying between Corfu and the mainland.

Hesperia nostradamus.—One or two, also taken on Vido.

No doubt many more butterflies would be obtained during May and June, and an excursion to the mountain chain of San Salvador, the highest point of which is 3000 feet above the sea, would produce some interesting species, but I was not able to undertake this.

From Corfu we went to Valona Bay, on the coast of Albania, where we remained for a couple of days, but I was unwell and unable to land, for which I was sorry, as it was a wild-looking place, and I should most likely have obtained some fresh species there. We then went across the Adriatic to Brindisi, where we arrived on Aug. 16th. The country in the neighbourhood of the town is uninteresting from an entomological point of view, the principal road taking you out in a straight line for miles between never-ending vineyards. It was very hot while we were there, and the roads were two inches deep in white glaring dust. I never saw such dust in all my life. On each side of the mouth of the harbour there are extensive tracts of marshy ground, dry at the time of our visit, but more or less flooded, I was told, during the winter months, and here *Satyrus statilius* var. *allionia* was very abundant, and in fine condition, some of the females measuring $2\frac{3}{4}$ inches.

The inner harbour forms into two portions, one arm extending to the right, and the other to the left, as you approach the main landing-place. At the head of the right arm, beyond the Ponte Grande, there is rather an extensive valley, through the centre of which, during the winter months, runs a small stream, but the day I visited it it was quite dry. Most of this valley was under cultivation—garden produce, maize, &c.—but there were some rough places here and there, where numerous wild flowers, especially fleabane and aster, were growing in masses. Common butterflies were plentiful, and among others I took some fine fresh examples of *Melitea didyma*, including one or two nice varieties. *L. batia* was common in a field of French beans, *P. podalirius* and *P. machaon* occasionally settled on flowers of wild aster, *E. ida* was plentiful among fleabane, but worn, several each of *S. alcea*, *S. malva*, and *H. nostradamus* were taken off wild thyme, and *E. grammica* was kicked up from rushes.

We left Brindisi on August 21st, and anchored off Ancona the next day. The city is picturesquely situated on the slopes of a hill between the two promontories of Monte Ciriaco and Monte Mariano. There are some nice country walks beyond the town, and good collecting-ground on the slopes facing the sea to the northward. In the latter locality *Lycæna telicanus* was tolerably plentiful on flowers of fleabane, and a *Zygæna angelica* I think, was booming about in some numbers. This, of course, was a second brood. *Pyrausta aurata*, *Scopula ferrugalis*, and *Acidalia rubiginata* were beaten from wild peppermint.

We arrived at Venice on Aug. 27th, but there was no collecting

ing to be done then, for every spare moment of our short stay was occupied in seeing as much as I could possibly do of this most beautiful city. However, one morning, in the People's Park, I noticed *P. machaon*, *L. telicanus*, *L. icarus*, *L. argiolus*, *H. linea*, and the *Zygæna* taken at Ancona.

We left Venice on the morning of September 3rd, anchored off Trieste the same afternoon, and remained there until the 15th. During our stay we had frequent thunderstorms, with very heavy rain, but the most severe one was between nine and ten o'clock on Sunday, the 12th, when the sky was one blazing mass of lightning, and the roar of the thunder incessant, and it was accompanied by a terrific downpour of hail and jagged pieces of ice, some of the stones being as large as pigeon's eggs. This occasioned an immense amount of damage to the olive-trees. I was on shore the next day and noticed the ground beneath the trees thick with the fruit that had been knocked off.

Trieste is a beautiful city standing upon the shore of an extensive bay, and running up the slopes of several hills behind, which are backed by higher hills, in some places under cultivation, but elsewhere clothed with woods of pine, oak, and chestnut. There are many delightful wooded slopes and valleys within easy reach, which in the proper season must be alive with insects. To one of these places, about four miles from the town, I made two excursions. The hill-side was about half-way between Trieste and Miramar, and I found the ground overgrown with scrub-oak, Spanish chestnut, heath, juniper, broom, &c. The heath was in bloom, and there were many attractive flowering plants besides. Butterflies were flying about in great numbers, the most abundant species being the brilliant *Lycæna bellargus*, which was very fine and fresh. *L. telicanus* and *L. astrarche* were common, and I netted one fresh female *L. argiades*. *Satyrus briseis* were numerous, but much worn; *S. semele* typical, and still in fine condition; *S. statilinus* and *S. hermione*, several of each, but not worth taking; *P. machaon*, one fresh example; *C. edusa* and *C. hyale* plentiful, and the latter very fine; *L. sinapis*, several; *Argynnis dia*, three or four in fine condition but small; *A. paphia* or *A. pandora* seen; *M. didyma*, a few; *H. linea*, one, and *Syrichtus* sp?, two examples which I have not yet been able to identify.

Another good locality near Trieste is the Boschetto, a wooded hill at the end of the Via dell Aquedotto, which is laid out in numerous paths, and is much frequented, late in the afternoon, by loving couples from the town. Here, one day, I took, in addition to most of the species already mentioned, *Satyrus actæa*, *P. egeria* var. *egerides*, *H. sylvanus*, and *Spilosoma fuliginosa*, the latter, I should think, must have been one of a third brood.

On Sept. 9th, while walking from Trieste to the Castle of Miramar, I saw a large fresh-looking female *Limenitis camilla*,

flying about some honeysuckle, but not having a net with me I was unable to catch it. Surely this was very late?

We left Trieste on Sept. 15th, and arrived at Pirano the same day. Pirano is only some ten miles from Trieste, and is situated just inside Madonna Point, at the south-west corner of the Gulf of Trieste. It is an old-fashioned little town, with an old wall and towers which used to protect it on the land side, and an old fortress. There are many delightful walks among gardens and vineyards, and above them on the hill-sides there is a certain amount of uncultivated ground, where I met with most of the species I observed at Trieste, *P. mæra*, of which I saw three or four, being the only addition. *C. hyale* was more plentiful here, and I saw another *L. argiades*.

On the afternoon of Sept. 17th, while passing a fence by the side of a small patch of Indian corn, I noticed a brown-looking object near the ground, upon one of the palings, partially hidden among some sprays of common bindweed which was climbing up the fence, and upon stooping down discovered that it was a large full-grown larva of *Sphinx convolvuli*. It was almost the exact colour of the piece of rail upon which it rested. There was a quantity of bindweed growing among and up the stalks of the Indian corn, and I had a long hunt in the hope of finding more, but did not do so. The next day I was passing the same place, and stopped to gather some food, when I was pleased to find a small larva about a week old. It was $1\frac{3}{4}$ inches long, of a pale glaucous-green colour, thickly irrorated with raised white dots, with seven oblique white stripes, bordered above by a darker shade of green on the sides. Spiracles orange; legs pink; horn nearly straight, slender, yellowish green, tip black. On Sept. 26th, while we were at Corfu, I landed on Vido Island to procure some food for the above larva, which by this time was nearly full-grown; and when I came on board I placed the bindweed upon a piece of newspaper, and when I removed it to put it into a bottle of water, I found two tiny little larvæ, which I must have picked with the food, crawling over the paper, and two days after I noticed that there were three small larvæ with the large one, so that there must have been an egg or another larva on the food. They appeared to be common on Vido, for on two other occasions when I went for food I picked either eggs or small larvæ, as I had eight altogether when we left. The larvæ fed up very rapidly, for the last just hatched, found on Sept. 27th, had buried by October 18th. The larvæ do not assume their brown coats until after their last change of skin; at least none of mine did.

It is rather difficult to rear larvæ on board ship. When they are small, and I know that they are not likely to bury or spin up, I place the food with a piece of stick in an ordinary wine-bottle, and then sleeve it, tying one end of the sleeve round the

neck of the bottle, and the upper part round the top of the stick. When they are full grown they are transferred to a biscuit-tin, with a square hole cut in the lid, over which I paste a piece of muslin; the tin is then half-filled with earth, and then it is ready for the larvæ to bury when they feel disposed, and of course they are supplied with fresh food until they do so. This plan answers pretty well. Unfortunately one of my tins in which four of the *convolvuli* larvæ had buried was jerked off a shelf by the concussion of one of our big guns, and I found earth and larvæ just about to change had fallen into my washing-basin, and there was an awful mess, and the shock to the larvæ caused them to produce malformed pupæ, which I had to throw away. The other four are now (Feb. 15th) well and healthy, and I am rather curious to know when the moths will emerge.

We left Pirano on Sept. 19th, reached Corfu on 21st, and sailed from thence on the 28th, arriving at Malta on 30th. Here we stopped until Nov. 5th, when we went to Marmarice, on the coast of Syria, where we arrived on 9th. It was then bitterly cold, and all the hills were covered with snow. Marmorice is a beautiful land-locked harbour, surrounded by irregular masses of lofty hills, mostly thickly wooded, especially the slopes facing the gullies. I should like to visit it in May and June, for it has the appearance of a likely looking hunting-ground. Next day I landed with a shooting party; there had been a sharp frost the previous night, and many of the pools were coated with ice. I found a full-grown larva of *A. atropos*, and also a small one only a few days old; this was bright green, with pale greenish-yellow stripes, and a long slender and almost straight horn. The former is now a healthy pupa; the latter I left, and am doubtful if it ever reached full growth, for the cold must have killed it. This was about my last capture in 1897.

H.M.S. 'Hawke,' Alexandria: Feb. 15th, 1898.

TORTRICES OCCURRING IN THE VICINITY OF THE CHESHAM LINE.

(Continued from p. 94.)

SIDERIA ACHATANA, Fabr.; Wilk.; Staint. (*Cydia achatana*, Mey.).—Not uncommon at Mill Hill and Neasden. May be obtained by beating hawthorn hedges.

SERICORIS BIFASCIANA, Haw.; Wilk.; Staint. (*Eucosma bifasciana*, Mey.).—Fairly common among Scotch firs in a small plantation near Midland station, Mill Hill. Larva feeds in the flowers of the pine.

SERICORIS RIVULANA, Scop. (*S. conchana*, Wilk.; Staint.

Eucosma rivulana, Mey.).—Some years pretty common in meadows at Northwood and Mill Hill.

SERICORIS LACUNANA, Dup.; Wilk.; Staint. (*Eucosma lacunana*, Mey.).—Generally abundant.

EUCHROMIA PURPURANA, Haw.; Wilk.; Staint. (*Eucosma purpurana*, Mey.).—Once at Chalfont.

ORTHOTÆNIA ANTIQUANA, Hübn.; Wilk.; Staint. (*Eucosma antiquana*, Mey.).—One fine fresh example of this species was found on a shop window in St. John's Wood. It had probably been brought in from the country as a larva or a pupa.

ORTHOTÆNIA STRIANA, Schiff. (*Euchromia striana*, Wilk.; Staint. *Eucosma striana*, Mey.).—I have only met with this at Chalfont.

ORTHOTÆNIA BRANDERIANA, Linn. (*Euchromia branderiana*, Wilk.; Staint. *Eucosma branderiana*, Mey.).—Sometimes met with in the larval stage in folded leaves of grey poplar at Northwood, but I have only twice seen the moth there.

PHTHEOCHROA RUGOSANA, Hübn.; Wilk.; Staint. (*Commophila rugosana*, Mey.).—Once met with in a field at Kingsbury near the dam of the Welsh Harp Reservoir.

CNEPHASIA MUSCULANA, Hübn. (*Lozotenia musculana*, Wilk.; Staint. *Cacœcia musculana*, Mey.).—Generally distributed and common almost throughout the whole district, but most frequently met with in lanes bordering woods.

SCIAPHILA NUBILANA, Hübn. (*Cnephasia nubilana*, Wilk.; Staint. *Tortrix nubilana*, Mey.).—Common in most hedgerows.

SCIAPHILA VIRGAUREANA, Tr. (*Cnephasia virgaureana*, Wilk.; Staint. *Tortrix virgaureana*, Mey.).—A very abundant species, and as variable as it is common.

SCIAPHILA HYBRIDANA, Hübn. (*Cnephasia hybridana*, Wilk.; Staint. *Isotrias hybridana*, Mey.).—Widely distributed and often common in certain hedgerows.

SPHALEROPTERA ICTERICANA, Haw.; Wilk.; Staint. (*Tortrix longana*, Mey.).—In meadows at Northwood in July.

BACTRA LANCEOLANA, Hübn.; Wilk.; Staint.; Mey.—Common in most marshy places, but there is less variation among the specimens than is found in some localities south of London. The moth is on the wing throughout the summer.

PHOXOPTERYX LUNDANA, Fabr. (*Anchylopera lundana*, Wilk.; Staint. *Ancylis lundana*, Mey.).—Common in lanes at Chalfont. There are two broods, the first appearing in May and the second in August.

PHOXOPTERYX MITTERBACHERIANA, Schiff. (*Anchylopera mitterbacheriana*, Wilk.; Staint. *Ancylis mitterbacheriana*, Mey.).—I have only met with this species at Chalfont. May and June.

GRAPHOLITHA RAMELLA, Linn. (*Hedya paykulliana*, Wilk.; Staint. *Cydia ramella*, Mey.).—Often abundant at Northwood among birches in the summer. There are two forms, and these occur in about equal proportions. July and August.

GRAPHOLITHA NISELLA, Clerck. (*Lithographia nisella*, Wilk.; Staint. *Epiblema nisella*, Mey.).—Occurs sparingly at Northwood, and most of the named forms are represented among the examples obtained there. July and August.

GRAPHOLITHA CINERANA, Haw. (*Lithographia cinerana*, Wilk.; Staint.).—Abundant some years on grey poplar at Northwood. A very much less variable species than the preceding. July.

GRAPHOLITHA SUBOCELLANA, Don. (*Lithographia campoliliana*, Wilk.; Staint. *Epiblema subocellana*, Mey.).—Of frequent occurrence at Northwood, Mill Hill, and Chalfont, but usually only observed towards evening when it flies over the tops of sallow bushes. End of May and June, and specimens have sometimes been captured in August.

GRAPHOLITHA MINUTANA, Hübn. (*Hedya minutana*, Wilk.; Staint. *Cydia minutana*, Mey.).—One example of this species was reared from a pupa found in a spun-up leaf of grey poplar at Northwood in the month of June.

GRAPHOLITHA TRIMACULANA, Don. (*Hedya trimaculana*, Wilk.; Staint. *Cydia trimaculana*, Mey.).—This very variable species abounds during the summer months among elms in all places. On the fences near the Kingsbury Station almost every gradation in the variation of the species was obtainable in 1883, a year in which the insect was even more abundant than usual.

GRAPHOLITHA PENKLERIANA, Fisch. (*Lithographia penkleriana*, Wilk.; Staint. *Epiblema penkleriana*, Mey.).—Only obtained at Chalfont and Chesham in July.

GRAPHOLITHA NÆVANA, Hübn. (*Steganoptycha nævana*, Wilk.; Staint. *Endemis nævana*, Mey.).—Not uncommon amongst holly wherever that plant is established, but the species was of annual occurrence in St. John's Wood, in gardens where there was not any holly. August.

PHLEODES TETRAQUETRANA, Haw.; Wilk.; Staint. (*Epiblema tetraquetrana*, Mey.).—Only noted from Northwood, but probably occurring in other wooded localities also. Generally a high flyer, and is on the wing around birch trees in the late afternoon during the month of May.

HYPERMECTIA CRUCIANA, Linn. (*H. angustana*, Wilk.; Staint. *Enarmonia cruciana*, Mey.).—Bred from sallow obtained at Mill Hill, Northwood, and Rickmansworth.

BATODES ANGUSTIORANA, Haw. (*Ditula angustiorana*, Wilk.; Staint. *Capua angustiorana*, Mey.).—Appears to be pretty generally distributed and sometimes very common.

PÆDISCA OPPRESSANA, Tr. (*Pæcilochroma oppressana*, Wilk.; Staint. *Enarmonia oppressana*, Mey.).—Common in June and July on trunks of aspen at Mill Hill, but not observed elsewhere.

PÆDISCA CORTICANA, Hübn. (*Pæcilochroma corticana*, Wilk.; Staint. *Enarmonia corticana*, Mey.).—Very common and exceedingly variable. At Northwood the specimens exhibit a greater colour variation than in any other place in the area here referred to.

(To be continued.)

NOTES AND OBSERVATIONS.

TÆNIOCAMPA STABILIS IN WINTER.—As bearing on the question of the autumnal emergence of the genus *Tæniocampa*, to which attention has been called (*ante*, p. 97), I may mention that I took a single male specimen of *T. stabilis* on an oak-trunk near here on Dec. 13th, 1893. The weather was very mild. I took *Cerastis vaccinii* the same evening. *Cheimatobia brunata* was abundant. As illustrating the mildness of the season, I may mention that I gathered two heads of *Narcissi* in bloom out of doors on the same day.—F. J. BRIGGS; Fursdon, Crown Hill R.S.O., S. Devon.

DIPTERA IN NOTTINGHAMSHIRE.—Mr. Percy H. Grimshaw has published in 'The Naturalist' (pp. 89-103, March and April, 1898) a preliminary list of Diptera occurring in Nottinghamshire. Over 240 species are enumerated, and of these by far the larger proportion are from one locality alone—South Leverton.

VARIATION IN *CALYMNIA TRAPEZINA* IN RUSSIA.—Several forms are noted as occurring during July, 1897, near Moscow. The specimens were captured upon sponges soaked in beer and sugar. Besides the type, unicolorous light yellow forms were met with which were without the usual black specks. Most were reddish or grey, with the light or darker central fascia common to the species. One variety, however, is exceptionally noticeable in its departure from the type. The ground colour is muddy grey, closely dusted with black, so much so that the stigmata cannot be made out, while the fascia exists as a broad black band; the hind wings are clear blackish grey, with light yellow fringes. Other examples closely approach *C. affinis* in ground colour and markings. It would appear that *C. trapezina* is not generally considered to be a very variable species in Eastern Europe.—A. LINDE, in 'Societas Entomologica,' xii. 130.—W. M.

A MEXICAN WAX-SCALE IN ENGLAND.—Dr. K. Jordan has just sent me specimens of a *Ceroplastes*, found at Tring on an orchid, *Chysis aurea*, Lindl., which had just been imported from Mexico. It proves to be *Ceroplastes cistudiformis*, Towns. MS., Ckll. (Zoe, 1893, p. 104), which was described as a subspecies of *C. psidii*, but is now regarded as a distinct species. Dr. Jordan's find is especially interesting, because this scale was hitherto known only from the original specimens collected by Dr. A. Dugès at Guanajuato, Mexico, and had never been found on orchids. The genus *Chysis* is native in Mexico, but the particular

species, *C. aurea*, is given as from Chili in the 'Index Kewensis.'—T. D. A. COCKERELL; Mesilla Park, New Mexico, U.S.A.

LARVA OF *CIDARIA SAGITTATA*.—Mr. H. F. Fryer (Ent. Mo. Mag. for April, p. 76) relates his observations on the feeding habit of the larva of *C. sagittata* in a state of nature. He states that when young it feeds on the flower-parts of its food plant, *Thalictrum*, and afterwards on the seeds, never touching the leaves, except when the supply of seeds runs short. This seems to be somewhat at variance with the recorded observations of other entomologists. It has been generally understood that the larva eats not only the seeds, but also the leaves, which it causes to wither by gnawing the stems.

CAPTURES AND FIELD REPORTS.

NYSSIA HISPIDARIA.—I am informed by Mr. W. J. Lucas that a specimen of *Nyssia hispidaria* was obtained by Mr. B. G. Cooper, near Oxshott in Surrey, on March 28th; and that *Brephos parthenias* was well out in the same district on April 3rd.—RICHARD SOUTH.

CAPTURES AT WATFORD.—On April 7th I found a female *Amphidasys striataria* (*prodromaria*) on a fence in this neighbourhood; and on April 2nd I captured a male *Teniocampa populeti* at sallow, also in this neighbourhood.—P. J. BARRAUD; Bushey Heath, Watford.

PIERIS RAPÆ.—On March 26th a rather small female *Pieris rapæ* emerged from a pupa which was bright emerald green in colour, and was found attached to a leaf of white jessamine in a garden in Kingston-on-Thames.—W. J. LUCAS.

LYCÆNA (POLYOMMATUS) ALEXIS (?) IN FEBRUARY.—Mr. Sydney Webb reports that a blue butterfly was seen by his son in the grounds of Dover College, on Feb. 15th. The identity of the insect was not ascertained by Mr. Webb, but he is of opinion that it was "a prematurely emerged *L. icarus* (*P. alexis*), the larva of which must have fed up instead of hibernating" (Ent. Mo. Mag. April, p. 87).

ENTOMOLOGY AT INTERLAKEN.—I should like to call the attention of lepidopterists who may be working on the Continent this season to a collecting-ground at Interlaken which abounded with *Rhopalocera* during the short time I was able to spend on it. I was most kindly directed to this ground by a stranger, who said he had often collected insects for gentlemen, and seemed to be a well-informed, practical entomologist. I reached the ground by walking from the Hotel National, where I was staying, to the street in which the Kursaal is situated, then turning to the left and keeping straight on. This brought me into the open country, with fields on one side and rising ground on the other. The best part of the collecting-ground was a rough, steep hillside, covered with scanty vegetation, but with plenty of insect life to enliven it. I was much delighted to see *Callimorpha hera*, so rare in this country, flying about in the blazing sunlight and settling on the plants. *Parnassius apollo* was another fine species found in this place, and in an adjoining wood I obtained *Vanessa c-album* in perfect condition, while *Leucophasia sinapis* was plentiful,

several often being on the wing at once. Unfortunately, having only one day's collecting, I was unable to work the place fully, or more species might have been obtained. In addition to the insects just noted, the following were taken on this occasion:—*Gonopteryx rhamni*, *Melanippe galatea*, *Argynnis dia*, *Thecla w-album*, *Polyommatus argiolus* (worn), *P. acis* (female), and a *Limenitis*, probably *L. camilla*.—GRAHAM RENSCHAW; Sale Bridge House, Sale, Manchester.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—April 6th, 1898.—Mr. R. McLachlan, F.R.S., Vice-President and Treasurer, in the chair. Sir Archibald Buchan-Hepburn, Bart., of Smeaton-Hepburn, Prestonkirk, E. Lothian, N.B., was elected a Fellow of the Society. On behalf of Mr. Greenshields, Mr. Jacoby exhibited specimens of the longicorn beetle, *Micropsalis durnfordi*, Burm., from Patagonia. Mr. Greenshields, who was present, stated that this species, remarkable for the great development of the palpi, was originally taken by Darwin; his own examples were taken hiding in thorny bushes in a dry water-course. Mr. Champion exhibited European examples of *Harpalus frohlichi*, a newly discovered British species. Mr. B. O. Bower showed living larvæ of *Caradrina ambigua*, an insect which had recently occurred in England in countless numbers. They were bred from ova laid by a female taken on the South Devon coast, and fed indiscriminately on low plants. Mr. M. Burr read a paper supplementary to Mr. Green's previous communication on *Dyscritina*, and referred the imagos definitely to the genus *Diplatys*, *D. longisetosa*, Westw., being a good species, and Mr. Green's new form proving to be *D. nigriceps*, Kirby. Dr. Chapman read a paper on the larva of *Eriocephala allionella*, which he stated to be essentially similar to that of *E. calthella*, previously described by him.—W. F. H. BLANDFORD, Hon. Sec.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—March 15th, 1898.—The Rev. C. N. Burrows exhibited a series of *Calligenia miniata*, showing considerable variation, some with scarcely any black markings on the fore wings, some orange, and two quite yellow in colour, instead of the usual pink or pale red. Mr. A. W. Mera, a cocoon of *Eriogaster lanestris*, which he had broken into, and in which he had found the larval skin of the caterpillar, two pupa-cases of parasitic Diptera, one large and one small, and the attenuated corpse of the dipteran which had emerged from the larger pupa, but which had not been able to escape from the compact walls of the cocoon. The lid of the smaller pupa-case was raised, and the legs of a dipterous imago protruded, but the fly had died in the skin, there being no room for its emergence. Mr. L. B. Hall exhibited *Enoplops scapha*, a large bug, and four beetles, *Athous difformis* (male and female), a species only found in the South of England, the female being very scarce, and having the thorax more spherical than the male; male and female examples of *Campylus linearis*. In this latter species the female is scarcer than the male, and has the elytra generally black, with testaceous borders, the elytra of the male being testaceous. All five insects were captured at Hastings.

Mr. H. Heasler exhibited a series of *Scaphidium 4-maculatum* taken under a rotten oak-log at West Wickham in February. The under sides of the male and female were shown, the centre of the metasternum of the male being depressed and pubescent; series of *Agathidium varians*, taken under a decayed branch at West Wickham, in which the male has the left mandible produced; a peculiar character which is present in varying stages of development in other members of the same genus (the members of the genus have the power of rolling themselves up into a ball); also several specimens of *Ennearthron affine* taken in two small pieces of dry boletus. Mr. E. M. Dadd read a paper translating and summarising Standfuss's work on 'Causes of Variation.' Discussion followed, especial interest being shown in the author's definitions of albinism and melanism. Mr. Tutt, Dr. Chapman, and Messrs. Prout, Nicholson, and H. Heasler took part, Dr. Chapman being of opinion that the reason why albinic specimens occur sporadically, whereas melanic tend to increase and found a race, might be explained by the fact that albinism is a sign of weakness in the individual, whilst melanism is the result of special vigour, and thus albinos die off, but melanic individuals transmit their variation to their progeny.—H. A. SAUZÉ, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — *March 14th, 1898* (Meeting held in the Free Library). — The President, Mr. S. J. Capper, F.E.S., F.L.S., in the chair. There was an excellent attendance of members. Mr. Mosley, F.E.S., Curator of the Huddersfield Museum, read a paper "On a new method of arranging a collection of Insects, with special reference to Lepidoptera." He pointed out that four main objects should be kept in view—(1) Economy of space and of expense; (2) facility in exhibition and examination of specimens; (3) preservation from destructive agencies (*e. g.* mites, &c.); (4) avoidance of unlimited destruction of life. In expanding his four main points, he especially disclaimed any idea of diminishing the existing large collections, and was of opinion that every town should have a large students' collection arranged in the ordinary way in cabinets. At the same time he advocated a new system of arranging one or two specimens in flat glazed tablets, showing also the life-histories either by the preserved larva and pupa, or by drawings of these stages; this he maintained was a cheaper method, saving space and expense; and secondly, the insects being near to the glass, could easily be examined by a lens without opening the tablet; at the same time the tablet could be held in one hand and the lens in the other; two specimens could easily be compared; all alteration due to inserting or increasing a series is saved; and the cases, being hermetically sealed, are secure from the attacks of mites, &c. Such a collection, he maintained, would be specially useful to teachers, and would help to lessen the destruction of species by making "long series" unnecessary. He then dwelt upon the objects of the larger collections, and expressly stated that he designed this smaller form of collection merely as an index to the larger. After showing three mounts in this tablet form, and giving particulars as to actual cost and arrangement of the tablets, he dwelt upon the advantage of drawings of varieties and aberrations, which, with notes on the species, could be kept in the same form. He

concluded his paper by a short reference to other groups besides the Lepidoptera, and suggested that an index collection such as this would be useful in museums. In the discussion which ensued, the President, and Messrs. Pierce, Moss, Freeman, Cotton, Gregson, Loche, Wilding, and Webster made suggestions, and criticised the methods of the speaker. Mr. Capper exhibited a remarkable variety of *Zygana loniceræ*; Mr. Prince, spring captures; Mr. Saxby, *Acherontia atropos* and *Smerinthus populi*; Mr. Moss, preserved larvæ; Mr. Johnson, an excellent series of varieties of *Arctia caia*, bred in January last, some of which were very dark specimens. Mr. Pierce exhibited a fine living example of *Periplaneta australasiæ*; and Mr. Freeman, eggs of *Orthosia macilentæ*.

April 4th.—The President in the chair.—Mr. F. W. Saxby gave a lecture on Photomicrography of Insect-structures. He used for illumination a very powerful jet of acetylene gas. In describing the apparatus he referred to this gas, jet, the doublet condenser, the microscope without eye-piece, the sleeve connecting the microscope with the camera, and lastly the camera itself. He afterwards photographed a slide of the vertical section of the compound eye of *Eristalis tenax*. The negative (developed in the building) showed well the many lenses with interspersed hairs, the optic nerves, &c. The lecturer, assisted by Messrs. Pierce and Freeman, then exhibited several slides of insect anatomy, among which were frenula and tentacula of a hymenopteron; front tarsi of *Dytiscus marginatus*. Mr. Webster exhibited *Papilio* from Lagos. Dr. J. Cotton exhibited a very long series of *Grammesia trilinea* var. *bilinea*, concerning which the President made a few remarks.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*March 21st, 1898.*—Mr. G. T. Bethune-Baker in the chair. Mr. J. T. Fountain showed a locust found in imported vegetables at King's Norton, and which had been identified by Mr. Malcolm Burr as *Acridium ægyptium*. Mr. P. W. Abbott, a short series of *Phorodesma bajularia* from Wyre Forest; a specimen of *Grammesia trigrammica* with the outer half of the wings from the median bar very dark, and the inner half light; also a series of *Hecatera dysodea* from the fens. He also showed a series of the Cornish *Lycæna arion* for comparison with some also exhibited by Mr. G. T. Bethune-Baker from the Gloucester locality. The Cornish ones were distinctly brighter, of quite a distinct type of blue, much gayer looking specimens. Mr. Bethune-Baker's specimens were taken in 1896, like the Cornish ones. Mr. Bethune-Baker also showed specimens from Switzerland, the Amoor &c., all more like the Gloucester than the Cornish specimens; distinctly dark varieties from Switzerland, the Ural, &c., var. *alpina*, and var. *obscura* from the Alps, and var. *uralensis*, in which the blue had nearly disappeared, from the Ural; also a number of other similar species of *Lycæna* from Europe and Asia. Mr. R. C. Bradley read a paper on the Aculeate Hymenoptera, illustrating it with eight boxes of insects, and some very good diagrams which had been drawn by Mr. A. H. Martineau. Mr. A. H. Martineau showed a box full of nests &c. of Aculeates in wood and pierced stems, also in illustration of Mr. Bradley's paper.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society, 1897. Part II. Together with the President's Address. Pp. i-xvi, 69-166.

The second part of these 'Proceedings,' extending to 114 pages, embraces the papers read before the Society during the latter part of 1897 and in January, 1898; and also the full reports of the meetings throughout the session, and other matters. The papers are:—"Recent Examples of the Effect on Lepidoptera of Extreme Temperature applied in the Pupal Stage," by F. Merrifield; "The Drinking Habits of Butterflies and Moths," by J. W. Tutt; "The Wing and Larval Characters of the Emperor Moths," by Prof. A. Redcliffe Grote; and "Notes on Hybrids of *Tephrosia bistortata*, Goetze, and *T. crepuscularia*, Hb.," by J. W. Tutt. In the President's Address the usual matters connected with the Society are referred to, the entomological work of the year reviewed and co-operation of workers in different branches of natural history advocated. We are pleased to note that the affairs of the Society continue in a very satisfactory condition, and that the membership is well on the way towards 200 in number.

ECONOMIC ENTOMOLOGY.

ENGLAND.—*Report of Observations of Injurious Insects and Farm Pests during the year 1897, with Methods of Prevention and Remedy.* Thirty-first Report. By ELEANOR A. ORMEROD. Pp. i-viii, 1-160. 1898. London: Simpkin, Marshall, Hamilton, Kent & Co. Limited. Many illustrations, and a portrait of Miss E. A. Ormerod.

AMERICA.—*Report of the Entomological Department of the New Jersey Agricultural College Experiment Station.* By JOHN B. SMITH. For the year 1897. Pp. 96. Eight plates and other illustrations in the text. Trenton: The John L. Murphy Publishing Co. 1898.

The Codling Moth (Carpocapsa pomonella). By M. V. SLINGERLAND. Cornell University Agricultural Experiment Station, Ithaca, New York Entomological Division. Bulletin No. 142. January, 1898. Pp. 69. Illustrated.

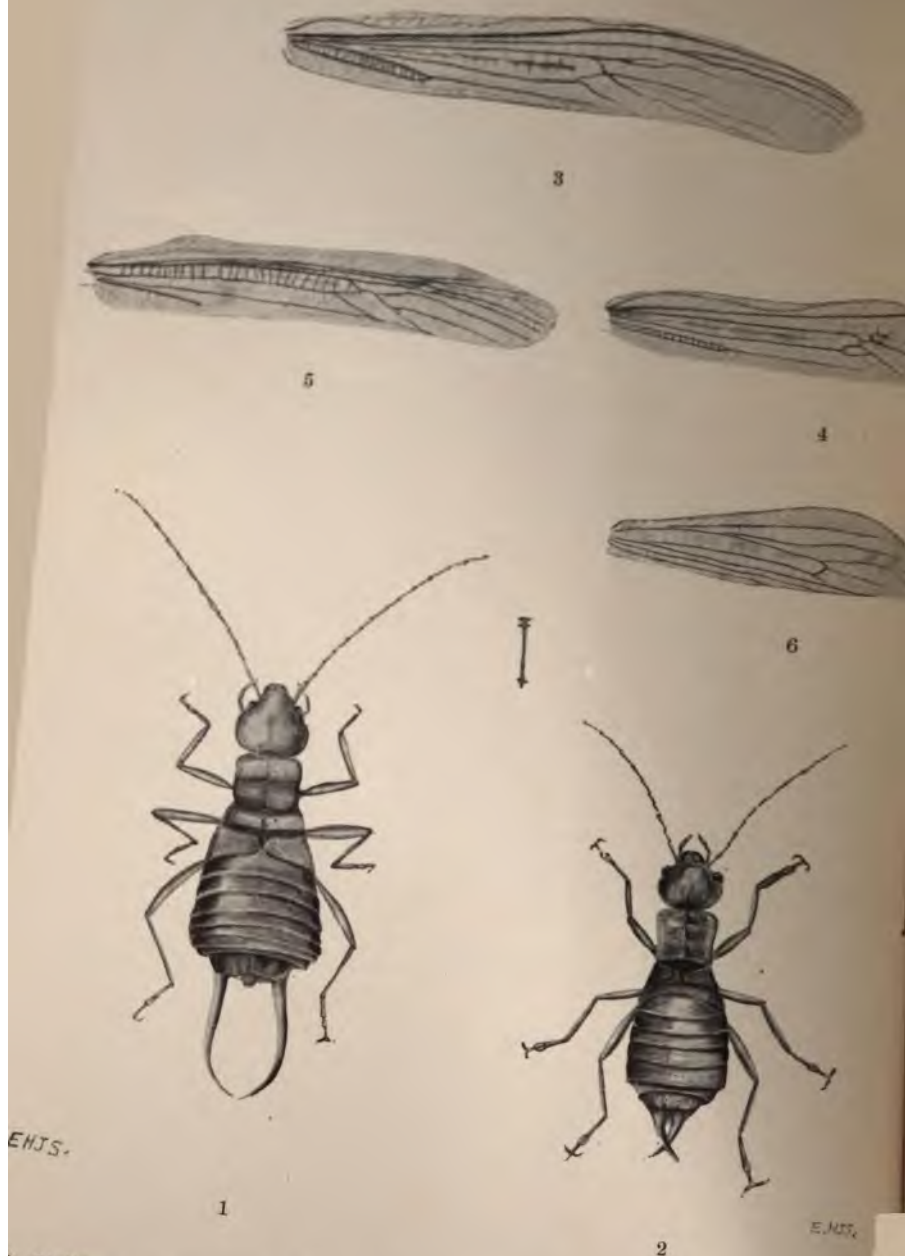
Preliminary Notes on the Codling Moth. By T. D. A. COCKERELL. Agricultural Experiment Station, Mesilla Park, N.M. Bulletin No. 25. February, 1898. Pp. 22.

The Peach Borer: Experiments with Hydraulic Cement. By JOHN B. SMITH. New Jersey Agricultural Experiment Station. Bulletin No. 128. February, 1898. Pp. 28. Illustrated.

Some Miscellaneous Results of the Work of the Division of Entomology. Prepared under the direction of L. V. HOWARD. Pp. 98. Illustrated. Bulletin No. 10, New Series. U. S. Department of Agriculture. Washington. 1898.

Recent Laws against Injurious Insects in North America, together with the Laws relative to Foul Brood. Compiled by L. O. HOWARD. Pp. 68. Bulletin No. 13, New Series. U. S. Department of Agriculture. Washington. 1898.





1. *Chelidura acanthopygia* ♂
 " " " ♀

Fig. 3. *Stenobothrus bicolor* ♀
 Fig. 4. " " ♂

Fig. 5. *Stenobothrus biguttatus*
 Fig. 6. " "

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ORTHOPTERA NOT YET BRITISH.

By MALCOLM BURR, F.Z.S.

(PLATE II.)

THE following short notes are not uttered in the spirit of prophecy, but rather to direct the attention of entomologists collecting in Britain to certain species which, judging from their general distribution, we may not unreasonably expect to be taken in this country. The three species which seem to me to be most likely to be discovered are one earwig and two grasshoppers, namely, *Chelidura acanthopygia* (Gènè.), *Stenobothrus biguttulus* (Linn.), and *Tettix fuliginosus* (Zett.).

CHELIDURA ACANTHOPYGIA (Gènè.).—The general appearance of this earwig may be seen from the figure. It is quite different from any of the species at present on the list as British. It is small, dark dirty brown in colour, with rudimentary elytra, and no wings. In the male the forceps are semicircular in shape, and unarmed, the apices nearly meeting, the branches slender and remote at the base. In the female the branches of the forceps are contiguous at the base, slender, straight, and unarmed, touching throughout their whole length, and crossing slightly at the apex. The chief points which distinguish it from its congeners are the broad abdomen, narrower at the apex, and the form of the subanal plate of the male, which is armed with a small blunt projection, sharply curved. This is not easy to distinguish at first, but can be seen from beneath with a lens.

According to Brunner, in the early part of the year it is to be found under stones and dried leaves, and later in the season on shrubs and brambles. It occurs in Europe from Belgium to the Mediterranean, and is found in the North of France. It seems to prefer elevated regions, and might well be taken on the Downs.

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STENOPOGONUS bicolor (Linn.).—This species, with the common English *S. bicolor* (Charp.), form a group of *Stenobothrus* quite distinct from all the other species of the genus. This is Brunner's fourth group, characterised by the dilated mediastinal area of the elytra and the sharply angled ridges of the pronotum.

Charpentier* was the first to recognize the distinction between the two species, but they were united as one by Fieber and by Fischer. Excepting Philippi,† de Selys Longchamps, and Brisout,‡ all authors regarded them as one, until Brunner carefully distinguished them in his invaluable 'Prodromus der Europäischen Orthopteren.' Orthopterists have since followed Brunner, and we owe to Krauss§ an excellent essay on the two species.

In his first work on French Orthoptera, Finot¶ allows himself to say that "Il m'est impossible de faire la séparation d'une manière certaine," but in his later and more comprehensive book** he distinguishes them after Brunner.

The difference between the two species lies in the venation of the elytra.

In his synoptical table of the genus Brunner gives the following points of separation:—

6. Area externomedia elytrorum haud ampliata, venis radialibus rectissimis. Area scapulari elytrorum vena longitudinali spuria instructa, venulis transversis rectis *bicolor*.

6. 6. Area externomedia ampliata, venis radialibus prima et secunda subflexuosis. Area scapulari el. vena spuria nulla, venulis transversis valde flexuosis *biguttulus*.

These points are subtle enough, but with a hand lens are quite distinct. In the male *biguttulus*, the anterior radial, as I prefer to call Brunner's externomedial area, is far more strongly arched than in *bicolor*; the actual marginal vein is stronger and thicker. In *biguttulus* the first and second radial veins are wavy, whereas they are quite straight in *bicolor*.

The females are somewhat more difficult. In *biguttulus* the scapular area has no extra, adventitious or spurious vein, and the small cross veins are distinctly wavy; in the female *bicolor* the scapular area is furnished with a small spurious vein running parallel with the radial veins, and the small transverse veins are straight.

* 'Horæ Entomologicæ,' 1825, 161.

† Orth. Berol. 1830, 86, tab. ii. fig. 6.

‡ Ann. Soc. Ent. Belg. vi. 51; xi. 81.

§ In Yersin, "Extraits d'une lettre adressée à M. L. Brisout sur les Orthoptères d'Hyères," Ann. Soc. Ent. France (3), iv. 1856, 48, note.

¶ Verh. z.-b. Ges. Wien, 1886, xxxvi. 141, tab. v. figs. 4 and 5.

¶ Orth. de la France, 1888, 60.

** Faune de la France, Ins. Orth.

Brunner lays too great stress upon the importance of the presence of a small black spot on the elytra of *biguttulus* where the marginal vein meets the radial vein. Krauss observes that this is also to be seen in *bicolor*, as I myself have noticed.

Krauss criticises Brunner's diagnosis, and re-establishes it as follows:—

STENOBOTHRUS BIGUTTULUS (Linn.).—♂. Elytra valde dilatata, margine antico arcuato-producto, area scapularis et externomedia ampliata, nitentes, pellucidæ, venæ radiales prima et secunda subflexuosæ. ♀. Elytra paululum dilatata, margine antico arcuato, area scapularis leviter ampliata.

STENOBOTHRUS BICOLOR (Charp.).—♂. Elytra parum dilatata, margine antico arcuato, haud producto, area scapularis parum, area externo-media haud ampliata, venæ radiales prima et secunda rectissimæ. ♀. Elytra valde attenuata, margine antico subrecto, margine postico parallelo, area scapularis haud ampliata, angusta.

Mr. Eland Shaw* was the first to recognize the fact that it is not at all improbable that *S. biguttulus* should occur in this country. In my 'British Orthoptera' † I have referred to this chance, and given, very briefly, the points of distinction.

On the Continent *S. bicolor* is the commoner species, and occurs in fields and open places, whereas *S. biguttulus* is found in woods. *Bicolor* is found throughout Europe from the most northern districts to the Mediterranean Sea; *biguttulus* is distributed, according to Brunner, from Scandinavia to the Alps, but does not occur in the extreme south. Finally, the stridulation of the two species is quite separate, but I cannot give the distinction, as I am not familiar with the chirp of *biguttulus*, which is due to the difference of venation.

TETTIX FULIGINOSUS (Zett.).—This rare species is at present only known from Norway, Lapland, and Siberia, but it might very well occur in the North of Scotland. It is considerably larger than either of the two known British species of the genus. Together with *Paratettix meridionalis* (Ramb.) it differs from *subulatus* in having the keels of the middle femora with the edges wavy, whereas they are straight in *subulatus*. With *subulatus* it differs from *biguttatus* in having the pronotum more or less flattened and not so tectiform as in the latter species, and in having the central keel considerably less elevated. (*Meridionalis* is essentially a southern species.) *Fuliginosus* further differs from *subulatus* in having the under part of the hinder tarsi sharply cut off into separate pads. This point is somewhat difficult to distinguish. Only the female is known to Brunner, who gives the dimensions as follows:—Length of body, 11 mm.; length of pronotum, 15 mm.

Bellagio, East Grinstead: May 9th, 1898.

* E. M. M. xxv. 1889.

† Page 37.

NOTES ON *SPHÆRIA LARVARUM*, WESTW.

BY GEORGE HOWES AND W. W. SMITH.

WHEN staying at Orepuke, a small mining town fifty miles from Invercargill, I took the opportunity of visiting the gold-sluing claims situated about one mile from the township, in what was at one time a large creek-bed, but which, when the miners started working at it, had long been filled in. The gold is in a black iron-sand which is found in two thin layers of shingle, one about fifty feet below the surface, the other about five feet below it. To reach the gold the earth has to be all washed away, and in washing it away large quantities of dead trees, ferns, and flax are washed out. In the trunks of the trees numerous specimens of the vegetating caterpillar (*Charagia virescens*, Walk.), called by the Maoris "aweto," are found. One of the miners gave me two, each four inches long, but they had been kept for a month in a tin, and had become very shrivelled. The miner told me that when taken from the logs under the earth they appear to be quite fresh and fat, and almost look as if they had just been killed; yet they must have been buried in the earth for hundreds of years, for above them trees were growing of a very considerable age.

The fungus which attacks the caterpillar sends out a stalk from its eye, which in the case of the two I possess is nearly two inches long. The body of the caterpillar becomes filled with a white woody substance, which preserves its shape. The logs they are found in are those of the rata tree (*Metrosideros lucida*). So far as I know, this is the first record of its occurrence in a semi-fossilized state.

GEORGE HOWES.

Invercargill, New Zealand: Jan. 3rd, 1898.

The valuable note on this remarkable vegeto-animal parasite by my young friend Mr. George Howes supplies an important item in the history and distribution of the species in New Zealand. In addition to its being the first record of the occurrence of *S. larvarum* in the South Island, it is, as Mr. Howes observes, the only record of its occurring in a semi-fossilized condition. The interesting discovery will also definitely settle the vexed question of the identity of the insect-host of this fungus. For some years doubt has been expressed by some entomologists in regard to the larva of *Charagia virescens* being the host of *S. larvarum*. The last to doubt its identity was the late Mr. A. S. Olliff, Entomologist to the Government of New South Wales. In a valuable illustrated paper on 'Australian Entomophytes,' Mr. Olliff discussed the question, and quoted

from several authors in support of his conclusions. The late Mr. A. H. Scott, author of 'Australian Lepidoptera and their Transformations,' is thus quoted by Olliff:—"We think it probable that the stems and trunks of *Metrosideros* furnish sustenance for the larvæ of the *Charagia virescens*; but these live and undergo their metamorphoses *within* the wood, effectually protected against injury from this particular fungus; and it is equally probable that the *external* portions of the finer roots of the same or neighbouring plants afford nutriment to the larvæ of such genera as pass their lives wholly in the earth, a state of existence which would render them exposed to the attacks of the *Sphæria (Cordyceps)*." Scott also stated that the host of *S. larvarum* has been incorrectly identified with the larvæ of *Charagia* by Hooker, Dieffenbach, Doubleday, and Taylor. To these conclusions Mr. Olliff added:—"In my opinion we have in these remarks the truth of the matter, and I am inclined to go even further, and to assert that all the larger fungi of the genus *Cordyceps* live upon, and at the expense of, subterranean larvæ and pupæ. In support of this assertion I would point to the fact that all the bulky species of which the hosts are definitely known have been found on root-feeding insects. As instances, I need only cite the Dynastidæ, Melolonthidæ, Elateridæ, and Lucanidæ amongst the beetles, *Cicada* amongst the Homoptera, and *Pielus* and *Trictena* amongst the moths. In all these cases the hosts are subterranean, and it follows that it is idle to speak of any connection between these parasitic fungi and the larvæ of wood-boring or foliage-eating and free living insects. The best known and the most abundant species are found on the early stages—larvæ and pupæ—of *Lepidoderma*, *Lepidiotia*, *Rhyssotus*, *Cicada*, *Pielus*, and *Trictena*, all of which live underground at the roots of plants. It is obvious," says our author, "that it would be impossible for large and highly-developed fungi, such as *Cordyceps*, which are sometimes of large dimensions, and which are frequently found growing at right angles to the axis of the body of their host, to grow within the narrow limits of the burrows made by these larvæ within their food-plants." These remarks also embody the opinions of a number of eminent entomologists.

Mr. Howes was careful to ascertain that these large larvæ with partially developed *S. larvarum* attached were found *in situ*, and were carefully extracted from the buried logs of *Metrosideros lucida*. Notwithstanding that they have been entombed for centuries, the fact appears incontrovertible that the parasitic *Sphæria* attacks and partially develops on the larvæ of *Charagia* within their burrows in the rata timber. There is no lepidopterous or other larvæ known to attain the size of those of *Charagia virescens* in New Zealand. The larvæ of the large longicorn beetle (*Prionoplus reticularis*) burrows in several tim-

bers, but is free—at least so far as is known at present—from the attacks of *S. larvarum*. The larvæ of *Charagia virescens* are the only known forms to attack rata timber. From the researches of Sir Walter Buller, it is evident that the *Sphaeria* occurs in many parts of the native forests in the North Island away from rata trees (Entom. 1895, 174). A perfect examination of the habitats of *S. larvarum*, and of the various sized larvæ found attacked by this entomophyte, is indispensably requisite in order to ascertain if one or more species of larva is attacked.

The numerous empty burrows of various depths of *Charagia virescens* occurring in rata trees suggest that the larvæ were attacked by the *Sphaeria* and sickened, and left their burrows to perish in the humus around the trees where the fungus flourishes. My young friend's interesting discovery of the *Charagia* larvæ in the rata logs places the matter beyond doubt that they are occasionally attacked by *S. larvarum* in their burrows.

W. W. SMITH.

Ashburton, New Zealand: March, 1898.

SOME NEW COCCIDÆ OF THE SUBFAMILY LECANIINÆ.

By T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

Pulvinaria marmorata, n. sp.

♀. With ovisac 11 to 13 mm. long, the scale itself 4 mm.; ovisac 3 mm. broad, cylindrical, firm, scarcely grooved, not adherent to objects which touch it; shrivelled female marbled with ochreous and black, margin dark, dorsum with a broad light longitudinal band, patches of glassy secretion here and there. Eggs pale yellow with a slight pinkish tinge.

♀. Boiled in caustic potash, stains the liquid light brown. Skin colourless, legs and antennæ yellow-brown. Antennæ 8-segmented, formula (13)248(56)7; first four segments not far from equal, 2 about two-thirds the length of 3. Rostral loop short. Legs ordinary; femur more than twice as thick as tarsus; tibiæ about three-fifths length of tarsus. Claw stout, rather long; all the digitules slender. Margin with short simple spines, few in number.

♀. Before forming ovisac *Lecanium*-like, very convex, $4\frac{1}{2}$ mm. long, 3 wide, 3 high, yellowish brown, speckled with black, with many little nodules of glassy secretion; back with a broad light band, across which dark lines mark the sutures between the segments. Younger examples are light yellowish, nodulose, with hardly any dark mottling.

Hab. Dripping Spring, Organ Mts., New Mexico, April 24th, 1898 (*Coll.*). It occurs on a small bushy perennial herbaceous plant, which I have not seen in flower. It has sublinear leaves dotted with glands.

From *P. marmorata* I bred a female parasite, *Coccophagus lecanii* (Fitch).

Lecanium (Calymnatus) impar, n. sp.

♀. Scale flat, $2\frac{1}{2}$ mm. long, $1\frac{1}{2}$ broad, dark chestnut-brown, with delicate raised lines radiating from the margin. Outline oblong or suboval, but always inequilateral, one side being nearly straight, the other well rounded out.

♀. After boiling semi-transparent, very light brown, not divided into plates, but segmentation visible at the margins. Skin not reticulated; sparsely beset with minute glands; a broad marginal area thickly beset with rather large hyaline spaces, arranged mostly in irregular rows radiating from the margin, often double. Anal plates with their outer sides about equal. Posterior cleft quite long. Two more or less distinct rows of large hyaline spaces in the middle line, between the anus and the mouth; these spaces are often small and in little groups, and when large they exhibit small round gland-spots upon them. Margin with extremely minute simple bristles, very few in number. Stigmatal spines in threes, short, sunken wholly beneath the lateral margin of the scale. Rostral loop very short. Legs and antennæ well formed, colourless; antennæ 6-segmented, 3 very much longest, longer than $1 + 2$, and usually longer than $4 + 5 + 6$; formula 3261(45); 2 and 3 each a pair of bristles near the end. Legs slender, femur rather short, tibio-tarsus long, the tarsus about two-thirds the length of the tibia, but the articulation very obscure, often not discernible, and as the tarsus is constricted near its middle, there seems to be a very long tibia with an extremely short tarsus. Tibia and tarsus each with a strong bristle not far from the end; tarsal digitules filiform but moderately stout, with distinct knobs; claw digitules stout, extending far beyond claw. The females studied contain embryos.

Hab. Las Minas, Tabasco, Mexico, June 3rd, 1897, on leaves of "Escobillo" (Townsend). Sent by Dr. L. O. Howard; Div. Entomology, No. 7808. Some are infested by a parasitic fungus, apparently an *Aschersonia*. *L. impar* is allied to *L. acuminatum*, Signoret. Superficially it looks a good deal like *L. tessellatum*.

Lecanium (Eulecanium) subaustrale, n. sp.

♀. Scale $6\frac{1}{2}$ mm. long, 3 wide, $2\frac{1}{2}$ high; very like *L. magnoliarum*, but rich dark ferruginous or chestnut colour, instead of brown, and without any blackish marbling; surface rather shiny, rugose and faintly tuberculate, not distinctly tuberculate as in *magnoliarum*. Much roughened at the sides, but not punctured as in *L. quercifex*. A hardly noticeable tendency to a dorsal keel. Skin (after boiling, by transmitted light) yellowish, chitinous, tessellated in the *Eulecanium* manner, with round gland-pits of various sizes, some quite large. Legs well formed, slender, coxa quite long, tibia hardly longer than tarsus with claw; claw stout; all the digitules filiform, with small but distinct knobs; digitules of claw extending considerably beyond the claw-tip, and a little beyond tip of tarsal digitules. Margin with

simple spines at very long intervals. Antennæ broken in the specimens studied.

Hab. Amecameca, Mexico, June 7th, 1897, on *Celtis occidentalis* (?), infesting the twigs (*A. Koebele*, No. 1758). Sent by Dr. L. O. Howard; Div. Ent. No. 7923. *L. subaustrale* is not related to any species known from the same region, but resembles several European forms — *L. elongatum*, *genistæ*, *berberidis*, and *mori*.

Lecanium (Toumeyella) tubuliferum, n. sp.

♀. Scale $5\frac{1}{2}$ mm. long, $4\frac{1}{4}$ broad, 4 high, when dried; but evidently larger when fresh, as it is distorted and shrunken from drying. Four dorsal longitudinal rows of pits, and many small pits at the sides. Colour light brown, rufescent towards the margin. Surface with a thin, inconspicuous, easily deciduous, glassy covering.

♀. Boiled in caustic potash, gives a dark madder-brown colour. After prolonged boiling the skin becomes transparent, suffused with brown, but not chitinous. It is very thickly beset with small tubular glands. There are also some large glandular patches, and in places immense numbers of bulbous glands, looking like knobbed processes. Antennæ rudimentary, minute, brown, bristly at tip. Legs absent. Margin, at least in an immature example, with very small spines at rather long intervals.

Hab. On twigs of *Quercus engelmanni*, with *Kermes grandis*, Amecameca, Mexico, May 25th, 1897 (*Koebele*, No. 1756). Sent by Dr. Howard; Div. Ent. 7920 (in part).

Lecanium perconvexum, n. sp.

♀. Scale $3\frac{1}{4}$ mm. long, $2\frac{1}{4}$ high, 2 wide; very convex, brown-black, not very shiny; with minute specks of a lighter colour, and irregular patches of dull white waxy secretion, especially at the sides.

♀. Antennæ represented by a short thick bristly protuberance. Legs very short, stout, tapering, with about the form of a carrot, femur and tibia broader than long. Skin chitinous, yellowish brown, with numerous large round and oval gland-pits, and some small glands interspersed. Marginal spines very small, simple.

♂. Scale very small, scarcely over 1 mm. long, about $\frac{3}{8}$ mm. broad, pale brownish, shiny, wrinkled, covered with a coating of dull white secretion, which is easily deciduous.

Hab. On *Nectandra*, Campinas, Brazil, Dec. 20th, 1897 (*F. Noack*). I sent Dr. Noack a more detailed account to publish in Brazil, but the essential characters are here given for the greater convenience of students. *L. perconvexum* is related to *L. punctatum*, *scrobiculatum*, *imbricatum*, and *urichi*.

Mesilla Park, New Mexico, U.S.A.: April 28th, 1898.

TORTRICES OCCURRING IN THE VICINITY OF THE CHESHAM LINE.

(Concluded from p. 119.)

PÆDISCA PROFUNDANA, Fabr. (*Pæcilochroma profundana*, Wilk.; Staint. *Eucosma profunda*, Mey.). — Only observed at Northwood.

PÆDISCA OPHTHALMICANA, Hübn.; Wilk.; Staint. (*Epiblema ophthalmicana*, Mey.). — Larvæ common in rolled leaves of grey poplar at Northwood, but the perfect insect is not often met with there. August and September.

PÆDISCA SOLANDRIANA, Linn.; Wilk.; Staint. (*Epiblema solandriana*, Mey.). — Larvæ often abundant in rolled leaves of birch, and the moth is common in July and August. Northwood and Chalfont.

EPHIPPIPHORA SIMILANA, Hübn. (*Halonota bimaculana*, Wilk.; Staint. *Epiblema similana*, Mey.). — A few specimens obtained each year at Northwood, but the species seems to be very local, and has only been observed in August and September.

EPHIPPIPHORA PFLUGIANA, Haw. (*Halonota scutulana*, Wilk.; Staint. *Epiblema pflugiana*, Mey.). — At Northwood and Mill Hill among thistles growing in damp places; not very common in the perfect state, but larvæ are fairly plentiful in the thistle-stems in the winter.

EPHIPPIPHORA BRUNNICHIANA, Fröl. (*Halonota brunnichiana*, Wilk.; Staint. *Epiblema brunnichiana*). — Found wherever coltsfoot is established. Very pale examples have sometimes been met with at Northwood.

EPHIPPIPHORA NIGRICOSTANA, Haw.; Wilk.; Staint. (*Eucosma nigricostana*, Mey.). — Occurs at Kingsbury, Mill Hill, Harrow, and Northwood. The moth is not often seen, but larvæ and pupæ may be freely obtained by collecting old stems of *Stachys sylvatica* during the spring.

EPHIPPIPHORA TRIGEMINANA, St. (*Halonota trigeminana*, Wilk.; Staint. *Epiblema trigeminana*, Mey.). — Has been met with now and again at Kingsbury, Harrow, and Mill Hill, but the species does not appear to be common at either place.

EPHIPPIPHORA TETRAGONANA, St. (*Halonota tetragonana*, Wilk.; Staint. *Notocelia tetragonana*, Mey.). — A few examples were captured at Mill Hill in 1877.

SEMASIA IANTHINANA, Dup.; Wilk.; Staint. (*Laspeyresia ianthinana*, Mey.). — This species was very common in 1887 at Kingsbury. The moths were flying in the late afternoon towards the end of July over a high hawthorn hedge.

SEMASIA WEBERIANA, Schiff.; Wilk.; Staint. (*Enarmonia*

wæberiana, Mey.).—Not uncommon in some gardens at St. John's Wood, Kingsbury, Hampstead, and Mill Hill.

COCYX OCHSENHEIMERIANA, Zell. (*Pammene ochsenheimeriana*, Mey.).—Northwood. One specimen in May, and one in June, 1893; and three examples in May, 1894 (*vide* Entom. xxvii. 242).

COCYX STROBILELLA, Linn. (*Asthenia strobilella*, Wilk.; Staint. *Cydia strobilella*, Mey.).—Frequently reared from spruce cones obtained at Chalfont.

COCYX SPLENDIDULANA, Guen. (*Asthenia splendidulana*, Wilk.; Staint. *Pammene splendidulana*, Mey.).—Occurs at Kingsbury and Mill Hill, and is sometimes very common. May be jarred from oak trees.

COCYX ARGYRANA, Hübn. (*Ephippiphora argyrana*, Wilk.; Staint. *Pammene argyrana*, Mey.).—Usually common on oak trunks in most localities. April and May, sometimes as early as the last week in March.

COCYX TÆDELLA, Clerck. (*Coccyx hyrciniana*, Wilk.; Staint. *Epiblema tædella*, Mey.).—Very common among spruce firs at Northwood. Some of the specimens are dark unicolorous, others are very pale in colour. By tapping the fir boughs the moths may sometimes be disturbed and netted by dozens at a time, and fine variable series obtained. May.

COCYX NANANA, Tr. (*Semasia nanana*, Wilk.; Staint. *Enarmonia nanana*, Mey.).—Occurs among spruce firs at Mill Hill, but seemingly not at Northwood. It flies in the late afternoon, and may be obtained by jarring the boughs. June.

RETINIA BUOLIANA, Schiff.; Wilk.; Staint. *Evetria buoliana*, Mey.).—Once at Mill Hill.

CARPOCAPSA POMONELLA, Linn.; Wilk.; Staint.; Mey.—The perfect insect flies around apple trees, and seems to be generally distributed. Larvæ common in apples in the autumn.

CARPOCAPSA SPLENDIDANA, Hübn. (*C. splendana*, Wilk.; Staint.; Mey.).—Larvæ in acorns at Mill Hill, Kingsbury, Harrow, Pinner, and Northwood; sometimes common. Imagines may be beaten from hedges under oaks, and also netted as they fly around the branches at dusk. July and August.

OPADIA FUNEBRANA, Tr. (*Carpocapsa funebrana*, Wilk.; Staint. *Epinotia funebrana*, Mey.).—The larvæ were very common in damsons some years at Mill Hill, but I only once succeeded in rearing the moth, and on that occasion only one example. Specimens have been netted once at Northwood and once at Rickmansworth; in each instance the moth was flying along a hedgerow in which blackthorn grew, and both examples were in poor condition.

STIGMONOTA INTERNANA, Guen.; Wilk.; Staint. (*Laspeyresia internana*, Mey.).—Common among furze at Northwood. Occurs in May and June, and flies in the afternoon in company with *Catoptria ulicetana*, from which species the males may be detected by their whiter hind wings. The females are more readily obtained by beating the furze over the open net, and then examining the latter.

STIGMONOTA REGIANA, Zell. (*Ephippiphora regiana*, Wilk.; Staint. *Pammene regiana*, Mey.).—Not rare in St. John's Wood and Regent's Park. The moth is most often found in the morning sitting on walls or palings under or near sycamore trees. June and July.

STIGMONOTA GERMARANA, Hübn. (*Endopisa germana*, Wilk.; Staint. *Pammene germana*, Mey.).—A few examples of the perfect insect have been taken at Mill Hill and Northwood. The larva feeds in rose-hips, and I have found the species in this stage in Epping Forest and elsewhere, but so far not in Middlesex or any other part of the area under consideration.

DICRORAMPHA POLITANA, Hübn.; Wilk.; Staint.—Often common among yarrow near the Midland station, Mill Hill; also occurs at Northwood and Rickmansworth. June.

DICRORAMPHA SEQUANA, Hübn.; Wilk.; Staint. (*Hemimene sequana*, Mey.).—Fairly plentiful among yarrow at Mill Hill; it occurs also at Kingsbury, Harrow, and Northwood. June.

DICRORAMPHA PETIVERELLA, Linn.; Wilk.; Staint. (*Hemimene petiverella*, Mey.).—Abundant among yarrow almost everywhere throughout the area.

DICRORAMPHA PLUMBAGANA, Tr.; Wilk.; Staint. (*Hemimene plumbagana*, Mey.).—Common in meadows at Mill Hill and Northwood in May and June.

CATOPTRIA ALBERSANA, Hübn. (*Grapholita albersana*, Wilk.; Staint. *Epinotia albersana*, Mey.).—Occurs sparingly in May and June at Northwood. The larva feeds in the autumn in folded leaves of honeysuckle, and the moth flies towards evening. I have not succeeded in finding the larvæ at Northwood, possibly because the food-plant there grows in tangled masses and is much mixed with briars, bramble, and hawthorn.

CATOPTRIA ULICETATA, Haw. (*Grapholita ulicetana*, Wilk.; Staint. *Laspeyresia ulicetana*, Mey.).—Common everywhere among furze.

CATOPTRIA CANA, Haw. (*C. scopoliana*, Walk.; Staint. *Epiblema cana*, Mey.).—Kingsbury, Northwood, and Chalfont. July.

CATOPTRIA HYPERICANA, Hübn. (*Grapholita hypericana*, Wilk.; Staint. *Epinotia hypericana*, Mey.). Chalfont, not common; occurs among St. John's wort in July.

CHOREUTES MYLLERANA, Fabr.; Mey. (*C. scintillulana*, Staint.).—I obtained a dozen examples of this species at honeydew on sallows at Northwood in 1892, but I have not seen it there since.

SYMETHIS OXYACANTHELLA, Linn. (*S. fabriciana*, Staint.; Mey.).—Occurs in all hedgerows, and is on the wing throughout the summer.

EUPECILIA DUBITANA, Hübn.; Wilk.; Staint. (*Phalonia dubitana*, Mey.).—Used to occur plentifully some six or seven years ago in a field alongside the Finchley Road, about half way between the North London Railway and Cricklewood. The ground was to be built on, but I believe that operations have not been begun yet, so that probably the insect may still be found there.

EUPECILIA MACULOSANA, Haw.; Wilk.; Staint.; Mey.—I have only observed this species at Northwood, and it does not occur very commonly there.

EUPECILIA AMANDANA, H.-S. (*E. sodaliana*, Wilk.; Staint. (*Commophila amandana*, Mey.).—Occurs at Kingsbury along the Brent where buckthorn is found.

XANTHOSSETIA ZOEGANA, Linn.; Wilk.; Staint. (*Euxanthis zoegana*, Mey.).—Only taken at Northwood along the railway embankment.

XANTHOSSETIA HAMANA, Linn.; Wilk.; Staint. (*Euxanthis hamana*, Mey.).—Occurs at Northwood, Rickmansworth, Chorley Wood, and Chalfont.

ARGYROLEPIA HARTMANNIANA, Clerck. (*A. baumanniana*, Wilk.; Staint. *Chlidonia baumanniana*, Mey.).—A few specimens have been taken each year at Northwood. The species occurs among rushes.

ARGYROLEPIA BADIANA, Hübn.; Wilk.; Staint. (*Phalonia badiana*, Mey.).—Only at Chalfont. Imago in August. Among burdock.

CONCHYLIS SMEATHMANNIANA, Fabr. (*Lozopera smeathmanniana*, Wilk.; Staint. *Phalonia smeathmanniana*, Mey.).—Only taken on two occasions, once at Mill Hill and once at Northwood; several specimens, however, were secured at each locality. The species in flying keeps close to the herbage.

CONCHYLIS STRAMINEA, Haw. (*Lozopera straminea*, Wilk.; Staint.). *Euxanthis straminea*, Mey.).—Only obtained at Chalfont.

TORTRICODES HYEMANA, Hübn.; Staint. (*Cheimatophila tortricella*, Mey.).—Only met with at Northwood, but no doubt generally distributed throughout the area.

RICHARD SOUTH.

NOTES AND OBSERVATIONS.

PROPOSED HANDBOOK OF BRITISH ODONATA. — We are very pleased to learn that Mr. L. Upcott Gill, the well-known publisher in the Strand, has conceived the idea of producing an illustrated Handbook to the British Dragonflies, and that he will immediately carry this out, if the small number of two hundred persons enter their names as subscribers at the modest sum of half a guinea. When it is understood that Mr. W. J. Lucas, with whose work on this group readers of the 'Entomologist' are familiar, is to write the book, we feel assured the project will not be allowed to fall through for lack of support. According to the prospectus before us, "it is proposed that the work shall contain beautifully coloured plates of the British Dragonflies, typical drawings in black-and-white of the eggs and nymphs, and structural figures of a very large number of microscopic and other details necessary for the careful study of the group, as well as certain other illustrations for the further elucidation of descriptive matter in the text. The plates are to be prepared from the author's drawings direct from nature, and therefore as to their accuracy there can be no question."

THE rapid sequence in the publication of works on more or less neglected groups and orders of British insects, each written by an authority on the special subject dealt with, may be regarded as a sign of progress, indicating as it seems to do that there is a demand for such works, and consequently that the number of students of those groups has increased. The wider interest of British entomologists in the insect fauna of their own country is not the least remarkable of the many noteworthy entomological events of the end of the nineteenth century. So recently as twenty years ago, not very much attention was given to anything outside Lepidoptera, and even in this order only native productions were greatly in favour. The student of to-day finds that the limited lepidopterous fauna of the British Islands does not afford all the material he requires to enable him to attain a full knowledge of his subject. He, therefore, either seeks the assistance of his *confrères* abroad, or himself visits foreign lands in quest of specimens and information. Then, again, there are many entomologists in this country who having completed, or almost completed, their collections of butterflies and moths, take up the study of other orders, and in adding species after species to the new collection renew the pleasure they experienced when forming their series of Lepidoptera. Trustworthy handbooks, well illustrated, should be a distinct boon to the class last referred to, and no doubt they often induce a worker in a new field to continue when he feels upon the point of giving up.

SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES.—The third Annual Congress of the Union will be held in the Town Hall, Croydon, on June 2nd, 3rd, and 4th, under the presidency of the Rev. T. R. R. Stebbing, M.A., F.R.S. Among the papers to be read on June 3rd is one by Mr. J. W. Tutt, entitled "Entomology as a Scientific Pursuit"; this will be given during the morning meeting, 11 a.m. to 1 p.m. In the evening of the same date Mr. Fred. Enock will present the "Life-

history of the Tiger-beetle," with lantern illustrations. Further particulars may be obtained on application to the hon. local secretary, Dr. C. Poulett Harris, 75, Morland Road, Croydon.

EXHIBITION.—The fourth Annual Exhibition of the Nonpareil Entomological and Natural History Society was held on April 20th and 21st last, and appears from the report, with which the hon. secretary has kindly furnished us, to have been very successful, both as regards objects and attendance.

NOTE ON THE LIFE-HISTORY OF *FORFICULA AURICULARIA*.—On April 2nd, 1896, in a rotten tree-stump in the fir-woods near Oxshott, I came across a female of the common earwig (*Forficula auricularia*) with a batch of pale yellowish-green eggs, which were of quite a considerable size for so small an insect. The earwig, with a few of the eggs and some of the rotten wood, were placed in a small glass-topped box. In this confined prison the mother carefully collected the eggs and placed them in a heap under the wood. If they were moved, or by moving the box were brought into the light, she carried them under cover, carefully lifting them with her jaws. So far the observations of De Geer were confirmed; but after the young appeared, which appearance took place in two or three days, she did not appear to me to pay much attention to them, though certainly I did not observe them so often as I might have done, or keep them in very natural conditions. Soon after hatching, the young were colourless and almost transparent, their heads being large, and their antennæ and forceps of inordinate length; the wings and wing-cases were, of course, quite wanting. The young soon became darker. Changes of skin occurred, but I cannot say how many times, and by towards the end of July the single survivor, a female, seemed to be mature. She was small, probably through being brought up under unnatural conditions, and not getting fresh food with regularity. They were usually fed on fruit, and I noticed on one occasion that they ate greedily of banana, antennæ and palpi moving incessantly the while.—W. J. LUCAS.

SPRING APPEARANCE OF *ASTEROSCOPUS SPHINX*.—It may be interesting to again record the winter survival of *Asteroscopus sphinx*. This spring the males of this species have been taken in small numbers in the moth-trap of the Hon. R. E. Dillon, at Clonbrook, Co. Galway, where the moth is so abundant in November. Those captured in March seem to be somewhat darker in tint than the bulk of the autumnal specimens. The only reference to its reappearance in the early months of the year that I know of is to be found in Hofmann's 'Raupen der Schmetterlinge Europas,' p. 123.—WM. FRAS. DE V. KANE.

TENIOCAMPA GRACILIS IN PERTHSHIRE.—Mr. W. Reid ('Annals of Scottish Natural History,' April, p. 119) states that *T. gracilis* is "curiously uncertain in its appearance, being more abundant every alternate season." In the year 1897, for instance, he only saw three examples of the species, whereas in the previous year it was so abundant that he secured over three hundred specimens, and another collector took two hundred more. The variation of *T. gracilis* in Scotland seems to be similar to that exhibited in Irish specimens, as referred to by Mr. de Vismes Kane in his remarks on the species (Entom. xxviii. 253).

ACHERONTIA ATROPOS IN RENFREWSHIRE.—In a note on this species in the April part of 'Annals of Scottish Natural History,' the writer, Mr. M. B. Taylor, says, "A very remarkable instance of the larvæ occurring in great abundance was on a farm near Port Glasgow, Renfrewshire. In this case they were obtained in potato-pits, and the farmer said he could have got barrowfuls of them, they were in such abundance." It would be interesting to know in what particular year this extraordinary host of *A. atropos* larvæ was noted, and also to learn what object the said larvæ may be supposed to have had in congregating in the potato-pits.

NOTE ON AULAX GLECHOMA.—As there seems to be some difficulty in obtaining perfect specimens of *Aulax glechoma*, an account of the way I obtained two may be of some use to collectors of the Cynipidæ. I took the galls on June 9th, 1897, from the back of Box Hill, where ground-ivy is plentiful, kept the plants in water for a day or two; afterwards they were allowed to be quite dry, and were then placed in a room where there was a fire once and sometimes twice a week, until March 19th, when I cut open one of the large galls. I only had three. I found the insect was fully developed, but barely alive, so I put it in a little box near the fire, and in a short time it was quite lively and the wings stiff. A week afterwards I cut open the other two; the first contained several galls with dead insects, and the other but one, which was alive, like the one in the first gall. One of these specimens is in our National Museum at South Kensington, and the only British representative in the collection. The smaller galls contained dead but fully developed insects.—F. MILTON; 7, Chilton Street, Bethnal Green, E., May 12th, 1898.

PLATYPTILIA TESSERADACTYLA, Linn.—This species, which was recently recorded from Ireland by Mr. Barrett (Ent. Mo. Mag. xxxiii. 25, and Entom. xxx. 74), is, according to Dr. Fernald (Pteroph. North Amer. p. 32), found in Massachusetts. In the monograph cited the food-plants of the larva are stated to be *Gnaphalium dioicum* and *G. arenarium*, and the following note on the life-history is given:—"The egg is pale green, smooth and somewhat elongated, and the larva in its earliest stage is clear white, with isolated hairs. Head, thoracic and anal shields black. Later (in September) the dorsal and lateral rows of rust-brown points appear; and in March, after hibernating, it becomes stout without increasing very much in length. The head, thoracic and anal shields are dark brown; dorsal stripe is crimson-rust colour; the subdorsal and lateral lines are of the same colour but finer. The ground colour of the body is yellowish above and rust-red beneath. The adult larva is a little smaller at each end and cylindrical in the middle. The head is small and black, the thoracic shields small, black, divided by a light line. The colour of the body is dark ferruginous brown. On the back stand whitish flecks, with two pairs of black tubercles on each segment, of which the hinder are placed farther from each other than those in front; similar tubercles occur on the sides, from which arise long light hairs. The anal shield and legs are dark brown. These larvæ frequently vary in the tone of the colour (Gartner)."

THE RHOPALOCERA OF THE WYE VALLEY.—The following is a list of the Diurni I have observed in the Wye valley, seven miles below Builth, and within a radius of five or six miles from Erwood Station, Cambrian Railway. The geological formation is Silurian and Old Red Sandstone, and the country is well wooded.

Argynnis paphia. Fairly common.—*A. aglaia*. A few occur every year, but it is far from common.—*A. adippe*. Much the commonest of the three larger fritillaries. All three occur more commonly than anywhere else in the district, in a sloping ferny wood near the waterfall of Graig-y-pwl-ddhw.—*A. euphrosyne*. Common everywhere. One season a few years ago they swarmed and were unusually large and in fine condition.—*A. selene*. Fairly common.

Melitæa artemis. Very rare. I have only seen it in the corner of one meadow, and that was some years ago.

Grapta c-album. Occurs every year in fair numbers, both in the autumn and in spring, after hibernation.

Vanessa urtica. Our commonest butterfly; I have seen it flying in the sunshine in almost every month of the year. It seems to sooner awake from its winter sleep on a fine sunny mild day than any other kind.—*V. antiopa*. I once saw some years ago a specimen of this beautiful insect at rest on a flower on the railway embankment near Abererch station. I was quite close, and am perfectly certain what it was. Unfortunately I had no net, and was unable to capture it.—*V. io*. Not very common.

Pyrameis atalanta. Commoner than the preceding.—*P. cardui*. Very uncertain; some years plentiful and then hardly a specimen is seen for two or three seasons. It has been very scarce lately.

Pararge megæra. Plentiful and fine.

Satyrus semele. Rare.

Epinephela ianira. Very abundant. I once took a female whose under wings were perfectly white, as if bleached.—*E. tithonus*. Plentiful.—*E. hyperanthes*. Only occurs in one wood, and sparingly there.

Cæonympha pamphilus. Very abundant.

Thecla quercus. Very rare, except in the Jubilee year, 1887, when they fairly swarmed round the top of some oak-trees in the wood near Craig-y-pwl-ddhw. They flew so high it was difficult to take them, but by tying my net to the bottom joint of a salmon-rod I got a nice series.—*T. w-album*. I have twice taken this insect.

Polyommatus phleas. Common. A few years ago it seemed to be getting scarce, but of late it has been numerous again.

Lycæna icarus. Very abundant.—*L. argiolus*. Common about holly-trees in spring.

Colias edusa. Is seldom seen, but in years in which it is plentiful in England a few specimens generally come our way.

Rhodocera rhamni. Very rare.

Anthocharis cardamines. Very abundant, and varies greatly in size. I have taken some very small specimens.

Pieris rapæ. Abundant.—*P. napi*. Common.—*P. brassica*. Not common, and seems to be getting rarer every year.

Hesperia tages. Common.—*H. linea*. Fairly plentiful.—J. W. VAUGHAN; The Skreen, Erwood, R.S.O., Radnorshire, May 14th, 1898.

NOTE ON THE DURATION OF THE LARVAL STAGE OF *TAPINOSTOLA BONDII*, KNAGGS (MORRISII, Tutt, *nec* Morris, *nec* Dale).—With regard to this species, Mr. Meyrick's 'Handbook' says: "Larva on *Festuca arundinacea*, 8;" meaning thereby that the larva in its final stage (see Introduction, p. 16) may be found on that plant in the month of August. My own impression is that this larva is an internal feeder; that the majority of the ova do not hatch till August; and that the final stage is not reached till ten months later on, namely, from the end of the present month, May, to the end of June, or even later. However that may be, it is now the season to put the matter to the proof, and I have therefore thought the present a fitting occasion to bring the subject before the entomological public. I believe that the collectors will have little difficulty in finding the larvæ, together with those of *M. furuncula*, at the bases of the flower-stems of the grass. In July, plenty of imagines may be taken, from which ova may be secured, and in August the collector may watch the hatching of the ova and the delicate little larvæ with their long silken hairs, which they soon lose, as they at once proceed to mine down the sheath of the grass.—H. G. KNAGGS; Folkestone, May, 1898.

LEPIDOPTERA FROM THE MEDITERRANEAN: ADDITIONS AND CORRECTIONS. The following errors occur in my "Notes," *ante*, pp. 108-116:—P. 109, line 14 from bottom, for "wrist" read "waist." P. 110, erase "larvæ on fennel" after "*Papilio podalirius*." P. 111, erase "both" before "common" after "*Pieris daphnide*." P. 112, line 10 from bottom, after "*Pararge*" read "*egeria* var. *egerides*," instead of "*egeria* and *egerides*."

Diloba caruleocephala. This species was accidentally omitted from the Malta list. The larvæ are extremely abundant during March and April, and do an immense amount of injury to almond and peach-trees, some of which I noticed were entirely stripped of their leaves.—GERVASE F. MATHEW; H.M.S. 'Hawke,' Malta, May 10th, 1898.

CEROPLASTES CISTUDIFORMIS AGAIN.—I stated, *ante*, p. 119, that this scale had only been found in Mexico by Dr. Dugis, at Guanajuato. Since that was written, Dr. L. O. Howard has sent me three lots of it, collected by Prof. C. H. T. Townsend at Tampico, Mexico, early in 1897. One lot is from *Cordia boissieri*, A. DC., one from Avocado pear, and the third from a thorny tree not determined.—T. D. A. COCKERELL.

CAPTURES AND FIELD REPORTS.

LEPIDOPTERA FROM NORTHERN AND SOUTHERN EUROPE.—In connection with the increasing attention given to continental insects, the following items may probably be of interest to readers of the 'Entomologist.' A friend of mine, visiting San Remo last year in the months of March and May, very kindly caught for me the following butterflies:—*Papilio podalirius*, three specimens, one taken March 19th, and two on May 8th. *P. machaon*, three, March 12th, March 20th, and May 9th. *Leucophasia sinapis*, one on March 20th. *Euchloë belia*, five, March 19th and May 8th. *Colias edusa*, three, March 16th and 20th. *Pararge egeria*, one, March 19th. *Lycana*

baton, Berg. (the *hylas* of Hübner and *hylus* of Fabricius), four specimens taken March 20th. *E. belia* might easily be mistaken for our *E. cardamines*, in spite of the entire absence of the orange tip even in the males. Yet, to my mind, it is a handsomer butterfly. The upper-wing tips are broadly black, and contain three white spots, the apical one being larger than the other two below it, and there is a very large black spot, boot-shaped, but with the heel cut off, in the male, and rectangular in the female. The under sides of the fore wings are tipped with green and spotted with silvery white, while the lower ones are wholly green and similarly spotted. The specimen of *P. egeria* is a typical one, and contrasts strongly with a series I have from Co. Waterford, the ground colour of which is nearly black, and the spots the palest of buff, nearly white. My friend also sent me a number of the larvæ—noted for their stinging hairs—of the “processionary moth” (*Cnethocampa processionea*, I think), which he found feeding upon the pines. They could not acclimatise themselves, although I kept them indoors, and they all died, chiefly after spinning up.

Another friend, Mr. J. Lyon Denson, of Chester, had a bicycle ride, in mid August, through Southern Norway. “It had been,” he writes, “hot and without rain for five weeks before I arrived. The first few days were fine, and plenty of mosquitos were biting. The remainder of my time was cooler and showery, so I was not troubled with the mosquitos further. Riding between Heen and Sorum, I came across scores of *Vanessa antiopa* in splendid condition. They were flying chiefly in the glades of the pine forest, and, notwithstanding my most energetic efforts, I failed to secure a single specimen, so extremely quick were they, and so ill provided was I, with only my little cycling cap. I offered half a kroner to a skydsgut who was driving a carriage with luggage, if he would help me with his big felt hat; but he shook his head and replied, in broken English, ‘No; it is not good to catch them;’ and I afterwards came to the same conclusion, as I nearly lost my camera through leaving it behind after a long chase. On another occasion, seeing a splendid specimen on something dark in the road, fanning its wings in the bright sunshine, I carefully made a swoop on it with my cap, but, alas! the insect soared away with the utmost indifference, and I found that I had got only a dead frog! *Polyommatus phlæas*, *Lycæna alexis*, *Epinephela ianira*, and ‘skippers’ were common. The ‘whites’ were badly worn. I noticed a number of *Vanessa urticae*, *Gonopteryx rhamni*, fritillaries like the one sent (*Argynnis latona*, and *V. atalanta*). Hundreds of dragonflies, big fellows, were sailing about in all directions. All these I noted nearly all the way from Christiania to Bergen. At Oilo I beat the moth (it looks like a very rubbed *Abraxas grossulariata*) out of some birch bushes, where I came across a large colony of the hill ant, near the river, consisting of upwards of a hundred mounds, varying from one to two feet in height, and all teeming with life.”—J. ARKLE; Chester.

EARLY APPEARANCE OF SYRICHTHUS ALVEOLUS.—In spite of the warm winter, everything in this neighbourhood is backward; but to my surprise on April 27th I took a freshly emerged grizzled skipper in a clearing in the woods bounding the old race-course. Two days later numbers were out flying about in the same place. Its usual time of appearance here is the latter half of May. Several specimens were extremely light in colour.—F. V. THEOBALD; Wye Court, Wye, Kent, May 7th, 1898.

ABUNDANCE OF CREPIDODERA RUFIPES.—On April 13th I received

from Maplescombe, Farningham, a boxful of the pretty flea-beetle (*Crepidodera rufipes*). This insect was swarming in some fields of tares. One field of five acres was half cleared off by them. The sufferer from this attack, Mr. Rogers, wrote me that the beetles were so thick up the rows as to make them look black. They were extremely active, and I found would not eat cruciferous plants given them; *Vicia* and *Orobis* seem the favourite food. The tares that were destroyed were on an old sainfoin ley.—F. V. THEOBALD.

NYSSIA HISPIDARIA.—I see you note (*ante*, p. 120) the capture of *N. hispidaria* on March 28th in Surrey. I took five specimens here last year on Feb. 10th, and two more a day or two later.—F. D. BLAND; Major 3rd York & Lanc. Reg., Llanrwst, N. Wales.

RHOPALOCERA IN NORTH WALES.—Within the last few days butterflies have been most abundant in this part of the Vale of Conway. On the road between Gwydyr Castle and Bettws-y-Coed, *Lycana argiolus* has been out in swarms, but it has been plentiful for the last ten days. On Saturday *Euchloë cardamines* was everywhere on the wing, and I saw *Vanessa urticae* (common), *V. io*, *V. atalanta*, *Pieris rapæ*, and one *V. c-album*.—F. D. BLAND; May 10th, 1898.

FIELD MEETING OF THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—Oxshott was again visited by members of the above Society on May 21st. Although the weather at 2.17 p.m., the time arranged for the departure from Waterloo, was not exactly promising for a country ramble, the conductors, Major Ficklin and Mr. Lucas, found, on the arrival of the train at Oxshott station, that they had a party of over a dozen to take charge of, and this number was shortly afterwards increased by two members who travelled down by a later train. Having regard to the appearance of the sky, which seemed to threaten a heavy fall of rain before long, a start was made for the pine-clad ground towards Esher, and ultimately the party arrived at the Black Pond, by which time the ominous clouds had passed away, giving place to brilliant sunshine, and this improved condition of meteorological affairs was maintained for the remainder of the afternoon. During the walk among the pines, and subsequently through the woods beyond, the entomologists of the party gave the tree-trunks very careful attention, but insects were only observed upon them at rare intervals, and those members who searched or beat for larvæ did not meet with much greater success. On returning to the cottage near the station, where tea was provided, it was ascertained that during the four hours' ramble the lepidopterists had only secured about thirty species, and the coleopterists about twenty species; those interested in other orders of insects also reported a great dearth of specimens and species. However, considering the kind of weather that had prevailed throughout the month up to the date of the visit, no one appeared to be disappointed at not meeting with better sport, but, on the contrary, the general feeling was that the afternoon had been a very pleasant one. The following is a list of the species taken or observed:—

COLEOPTERA.—*Nebria brevicollis*, *Necrophorus mortuorum*, *Mysia oblongoguttata*, *Anatis ocellata*, *Halysia 18-guttata*, *Coccidula rufa*, *Dolopius marginatus*, *Donacia sericea*, *Lochmea suturalis*, *Anaspis geoffroyi*, *Rhynchites æquatus*, *Strophosmus coryli*, *S. lateralis*, and a few small beetles not yet identified.

LEPIDOPTERA.—*Gonopteryx rhamni* (ova), *Drepana falcataria*, *Panolis piniperda*, *Ellopiopsis prosapiaria* (lar.), *Odontopera bidentata*, *Tephrosia binudularia*, *T. punctularia*, *Pseudoterpna pruinata* (lar.), *Geometra papilionaria* (lar.), *Zonosoma pendularia*, *Scodionia belgiana*, *Ematurga atomaria*, *Bupalus piniaria*, *Cheimatobia brumata* (lar.), *Oporabia dilutata* (lar.), *Larentia viridaria*, *Eupithecia nanata*, *E. indigata*, *E. pumilata* (lar.), *Thera variata*, *Coremia designata*, *Scoparia ambigua*, *Catoptria ulicetana*, *Talæporia pseudobombycella* (case), *Fumea intermediella* (case), *Incurvaria muscallella*, *Adela viridella*, *Gelechia ericetella*, *Coleophora vibicella* (case), *C. ibipenella* (case).

NEUROPTERA.—*Libellula quadrimaculata*, *Agrion puella*, *A. cyathigerum*, *Pyrrhosoma minus*, *Raphidia* sp., *Hemerobius micans*, *H. nitidulus*, *H. limbatus*. A species of *Nemoura* and two species belonging to the Trichoptera were not determined.

RHOPALOCERA IN SOUTH WALES.—I have seen many specimens of *Pieris brassicae* during the last ten days. It has been generally scarce here since 1894, when from some cause it almost disappeared. A great deal of rain has fallen during this month (May), and on several occasions the temperature has been low, so that I think Lepidoptera are later than in some seasons. *Lycana icarus* is only just appearing, but *Polyommatus phlaeas* and *Argynnis euphrosyne* have been out a little time in warm and sheltered localities.—T. B. JEFFERYS; Langharne Carmarthenshire, May 28th, 1898.

PAPILIO MACHAON AT HORNSEY.—On Sept. 25th, 1897, I saw two specimens of *P. machaon* on Muswell Hill. They were together, and as far as could be seen in good condition. Not having a net with me at the time, I could not even try to capture them. Four and a half years ago I saw one in Middle Lane, Hornsey; since then I had not seen it until Sept. 25th. I understand that in years gone by this species was not uncommon in this locality.—LINDEN HEITLAND; Amberley House, Crouch Hill, N., Feb. 8th.

[Probably escaped from, or set at liberty by, someone residing in the neighbourhood.—E.D.]

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — May 4th, 1898. — Mr. R. Trimen, F.R.S., President, in the chair. Mr. H. G. Palliser, of 6, Mount Park Road, Ealing, W., was elected a Fellow of the Society. Colonel Yerbury exhibited a series of Diptera collected at Hyères during March and April, 1898, and including *Brachypalpus valgus*, Panz., *Callicera fagesii*, Guér., and a species of *Platystoma* which appeared to be undescribed. Mr. Barrett showed aberrant forms of British species of Lepidoptera from Gloucestershire and Warwickshire. Mr. Waterhouse exhibited two burnished golden beetles, *Anoplognathus aureus*, from Queensland, and *Plusiotis resplendens* from Panama, which he stated to be interesting examples of a similar result being attained by a process of natural selection in two species of the same family in widely separated localities. Many members of the family had a slight tendency to show metallic colours. It would be interesting to ascertain whether there were any similarity in their surroundings in the two

countries which would make this golden appearance an advantage, or whether it might be considered a "warning colour." Allied species, however, appeared to be edible. Mr. Walker exhibited specimens of the rare *Philonthus fuscus*, Grav., found in a *Cossus*-eaten poplar in Chatham Dockyard at the end of April. Mr. R. McLachlan communicated a paper on "Neuroptera-Planipennia belonging to the families Osmyliidæ, Hemerobiidæ and Chrysopidæ, taken by the Rev. A. E. Eaton in Algeria."—W. F. H. BLANDFORD, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*March 24th, 1898.*—Mr. J. W. Tutt, F.E.S., President, in the chair. Mr. Adkin exhibited specimens of *Grammesia trigrammica* (*trilinea*) in which the ground colour was so darkened as to obliterate the usual transverse lines. These were known as the Lewis form. Mr. Moore, a pale pigmented variety of *Anosia menippe* (*archippus*) from the Malay Archipelago. It was noted that such a variation of this species was hitherto unknown. Mr. Cant, a series of strongly-marked specimens of *Hybernia defoliaria* from Dean Forest, and a dark costal form specimen of *Xylocampa conspiciellaris* from Worcester.

April 14th.—Mr. R. Adkin, F.E.S., Vice-President, in the chair. Mr. Harrison exhibited a number of living specimens of a coleopteron from Bombay. It was a species of the *Cassida* group, and looked like a piece of pure gold. It was stated that this appearance was lost after death. Mr. South exhibited hybernated specimens of *Peronea ferrugana* and *Cerostoma radiatella* from Oxshott, where they were obtained this spring; also, on behalf the Rev. A. Snell, a curious specimen of *Leucania littoralis* with dark hind wings and fringes to fore wings. Mr. Ashby, specimens of the spring-tail, *Machilis polypoda*, taken under wood and stone in the New Forest. Mr. Adkin, various specimens of the Tephrosias. Mr. South, a number of Japanese Lepidoptera, kindly lent by Mr. Leech to illustrate his (Mr. South's) paper entitled "British Species of Lepidoptera occurring in Japan."

April 28th.—Mr. R. Adkin, F.E.S., Vice-President, in the chair. Mr. Bishop exhibited a varied series of bred *Teniocampa miniosa*, and remarked that a large proportion of the specimens had the claws of the front legs undeveloped, and were thus unable to cling to vertical surfaces. Mr. Sauzé, a series of *Brachinus crepitans* from Swanage, very variable in both size and colour. Mr. Edward Saunders sent a series of Hemiptera-Heteroptera, comprising examples of most of the genera of this group, to illustrate his paper. Mr. West (Greenwich), a large number of Hemiptera, taken by himself during the last three years. Mr. Adkin, a series of bred *Eugonia quercinaria*, including gynandromorphous specimens, together with mounted examples of the genitalia and enlarged photographs of the same, and read detailed notes. A paper communicated by Mr. Edward Saunders, F.L.S., entitled "Notes on Collecting British Hemiptera" was then read.

May 12th.—Mr. J. W. Tutt, F.E.S., President, in the chair. Mr. J. W. Downing, of Tooting Graveney, was elected a member. Mr. Adkin exhibited red specimens of *Cidaria unidentaria*, and Mr. Tutt said there was no doubt as to this form occurring in the species, as it had recently been bred. Mr. Moore, specimens of *Anasa tristis*, the

squash-bug; *Murgantia histrionica*, the harlequin cabbage-bug; *Anopthalmus tenuis*, a blind cave-beetle; and *Blissus leucopterus*, the chinch-bug, all from the United States of North America; and contributed notes. The blind beetle was from the famous Wyandotte caves. Mr. Tutt, a specimen of *Libythea celtis*, taken in S. France after hibernation, and set to show the protective resting habit, the veins and markings of the lower side and the palpi and antennæ admirably resembling a dead but still attached leaf and its stalk. Mr. Jones, a very large number of European Lepidoptera, mostly bred and in the finest condition, to illustrate his paper on the subject of "Collecting in the Riviera." Mr. Tutt and Dr. Chapman gave details of their recent experiences in the district.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—May 9th, 1898. —The President in the chair. Mr. F. R. Dixon Nuttall, F.M.S., was elected a member. Mr. F. M. Pierce, F.E.S., read a paper entitled "Recent Investigations of the hair-pencils on certain Noctuæ." After a short summary of the immense field of research open to entomologists, the lecturer proceeded to add to the width of that field by a description of the classificatory use of this hairy organ. Describing how he was led to a study of this subject by a specimen of *E. nigra*, he proceeded to point out the frequent occurrence of this organ in several—in fact, in most—of the species of Noctuina. The organs, briefly described, are a pair of chitinous flaps, one at each side of the ventral surface of the abdomen and close to its junction with the thorax. From each of these flaps proceeds a pencil of fine hairs, closely agglutinated at the base, separating towards the apical half, and then enclosed in a pocket further down the abdomen, and generally more towards the centre. He illustrated his paper by excellent diagrams and microscope slides. He contrasted these pencils with the tarsal tufts of the Herminidæ, pointing out that these are hairs, not scales, and are joined for a considerable distance, while each hair after separation is marked with a network of rhombi, each with a raised centre, not with pits and striations, as in the scale-tufts of Herminia. He proved these organs to be specific, not accidental, but disproved the suggestions as to their being respiratory organs and so on, as found in the writings of Inchbald, Matthews, Westwood, Kirby and Spence, and Allis. He also explained how these organs apparently have been overlooked in so many species, by the fact that they are, as a rule, enclosed in the above-mentioned pockets. He attributed to them some unknown sense, and gave a list of species proved to possess or to be without these organs. After an account of the different sizes and shapes they manifest, the lecture closed with a discussion. One of the points brought out in discussion was the possibility of these being scent organs, not necessarily for receiving sense of scent, but for distributing the scent. The discussion also attempted to associate their absence with the presence of pectinated antennæ. Exhibits by Messrs. Cappe, Pierce, Cotton, Thompson, Birch, Freeman, and Prince, closed the evening. The next meeting is to be devoted to exhibits only, and is to be held on Oct. 10th.—(Rev.) R. FREEMAN, M.A. *Reporting Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*April 18th, 1898.*—Mr. R. C. Bradley in the chair. Mr. P. W. Abbott showed a very fine series of *Heliothis peltigera*, taken in South Devon last year. Mr. R. C. Bradley showed a small lot of insects collected during a holiday spent in Norway last year. He spent most of his time cruising in the fiords, &c., and was only able to collect a very little at times when on shore; amongst his captures were *Boarmia repandata* with pale blotches in the disc of the fore wings, and very fine varieties of *Bombus agrorum*. Mr. Martineau showed a fine large *Sirex gigas* (female), taken in a grocer's shop at Solihull.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Revision of the Orthopteran Group Melanopli (Acridiidae), with special reference to North American forms. By SAMUEL HUBBARD SCUDDER. [From the 'Proceedings of the United States National Museum,' vol. xx. pp. 1-421 (with Plates i-xxvi.)] Washington: Government Printing Office. 1897.

Gor up in the usual lavish style of the American State publications, and being illustrated by twenty-six well-executed plates, each containing numerous figures, this Revision cannot fail to satisfy and be useful to the student of a branch of the Orthoptera so numerous represented in North America. This group, in fact, forms the prevailing type of Orthopteran life throughout its area, and is almost confined to that continent. But one genus, *Podisma*, Latr. (*Pezotettix*, Burm.), is found in the old world, where, however, it is more abundantly represented than in the new; it encircles the globe north of the 35th parallel. The *Melanopli* are a part of the *Acridiidae* (to which family the locusts of the East belong), of generally small or medium size, never very large. The best known representative, though luckily only by repute to dwellers outside America, is the "Rocky Mountain locust" (*Melanoplus spretus*), so destructive sometimes in the western half of the Mississippi valley.

W. J. L.

Gynandromorphous Macro-Lepidoptera of the Palearctic Region, vol. ii. *On the Physiology of Hermaphrodite Macro-Lepidoptera.* OSKAR SCHULZ.

THE German notice of these books is a very favourable one. It appears that all the records of gynandromorphous species in the Palearctic Region are tabulated in a convenient form for purposes of reference; while in the second book, concerning the structure of hermaphrodite forms, the characters of the genitalia are discussed.

W. M.

The Pterophoridae of North America. By C. H. FERNALD, A.M., Ph.D. Pp. 80, plates i-ix. Massachusetts Agricultural College. 1898.

DR. FERNALD considers that, with the removal of the genus *Chrysocorys* from the group, the *Pterophoridae* should be placed in the vicinity of the *Pyalids*, and in this opinion he is probably in agreement with the majority of entomologists. We note that in very few

instances is there any reference to the earlier stages of the species dealt with, and where particulars are given of the larva and pupa majority of such details are taken from European, chiefly English sources. It would seem then that since the publication in 1880 'Pterophoridae of California and Oregon' by Lord Walsingham, the interesting insects have not received, up to date, very much attention at least not to the extent of elucidating their life-histories. The genera employed are as follows:—1. *Trichoptilus*, Wlsm., three species; 2. *Oxyptilus*, Zell., four species; 3. *Platyptilia*, Hübn., nineteen species including *cosmodactyla*, Hübn., *acanthodactyla*, Hübn., *tesseradactyla*, Linn., and *marginidactylus*, Fitch=*bertrami*, Roessl.; 4. *Alucita*, Linn. (= *Aciptilia*, Auct.), three species; 5. *Pterophorus*, Geoff., twenty-four species, several of which are usually referred to *Lioptilus* (*Leioptilus* Wallgr., and including *monodactylus*, Linn., which Walsingham places in *Pterophorus*, Wallgr., and Meyrick (Handb. Brit. Lep.) includes in *Alucita*, Linn.; 6. *Stenoptilia*, Hübn. (= *Mimeseoptilus*, Wallgr. four species, one of which is *pterodactyla*, Linn.; 7. *Orneodes*, Latr. (= *Alucita*, Auct., nec. Linn.), one species, *hexadactyla*, Linn. The plates comprise figures of structural detail, chiefly of genitalia, and add considerable value to the work.

British Orthoptera (Earwigs, Grasshoppers, and Crickets). By MALCOLM BURR, F.Z.S., F.E.S., &c. With six plates by S. L. MOSLEY, F.E.S. 8vo, 68 pp. Huddersfield: The Economic and Educational Museum. 1897.

SOME of the species described and otherwise referred to in this handy little book are among the most common objects of the country whilst others are included in the category of familiar household insects. Others again, and these by far the greater number, are probably almost, or quite, unknown to most people, whether interested in entomology or not. For this reason, therefore, Mr. Burr's contribution to our knowledge of British Orthoptera is exceedingly welcome and will most certainly be obtained and duly appreciated by those who have been in ignorance, chiefly because they lacked the means of readily identifying the insects of this order when met with. The book before us will remove this difficulty, and we shall henceforth have but little trouble in determining any earwig, grasshopper, locust, or cricket that may present itself during our rambles through the open country or even in the course of our business pursuits elsewhere. The work bears undoubted evidence of having been most carefully prepared, consequently it is to be regretted that those responsible for it while passing through the press have allowed errors to creep in apart from these blemishes, and as regards the text, we have nothing but praise. We wish we could say as much for the plates, but unfortunately they are not as satisfactory as they might be. It is certainly a mistake in works of this kind to give coloured plates unless they can be produced so as to show the tints proper to the insects represented. Well executed black and white figures are perhaps not so attractive in appearance, but they are much to be preferred to poorly coloured plates. On the whole, however, we believe that the book will supply a long felt want, and we heartily commend it.

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HYBRIDIZATION.

IN 'Science Progress' for April there is an important paper by Dr. Dixey on "Recent Experiments in Hybridization conducted by Dr. Standfuss, of Zürich." Referring to fertile and infertile pairings between species of Lepidoptera, our author remarks that in five cases only male specimens resulted, whilst in five others only female examples were reared, and these latter "contained no eggs capable of development." Seven other crosses again produced both males and females, but the former were in the majority and the latter were sterile. After referring to still five other crossings, he mentions that according to Standfuss "In no single instance has the female of any true hybrid among Lepidoptera been shown experimentally to be fertile." All who are studying the facts of hybridization will no doubt make a point of seeing this valuable contribution to the subject, but in the meanwhile we venture to give one or two extracts therefrom that will interest readers who rear the species mentioned.

"ABERRATIONS.

"Some very remarkable facts are recorded as to the effect of crossing a sport or aberration with its parent form. The result, which is entirely different from that which follows the crossing of distinct species, or even of local races, may be broadly stated as follows: When an aberration is crossed with its parent form the issue is sharply divided, in both sexes, into specimens of the aberration and of the normal form of the species. Thus in the dark aberration *zatima*, Cr., of *Spilosoma lubricipeda*, Esp., there are many degrees from the least dark form of the aberration (ab. *intermedia*, Bang-Haas) up to the darkest (ab. *deschangei*, Dupuis); but no transitional forms occur to bridge over the wide gap between *intermedia* and *lubricipeda*, nor can they be produced by crossing these two. 'It seems,' so Standfuss expresses it,

'as if there were antagonistic characters which cannot co-exist in the same individual.' Instances follow which will be briefly noticed here. For full details, which are of great interest, the reader is referred to the 'Handbuch,' pp. 305-321.

"*Spilosoma lubricipeda*, Esp., ♂, and ditto var. *zatima*, C. ♀.—These, crossed by Burckhardt in 1889, gave *lubricipeda intermedia* and *zatima* (*intermedia* being, as just stated, merely a less dark form of *zatima*). Two of these *intermedia* were paired giving again *lubricipeda*, *intermedia* and *zatima*. In this third generation several pairings were effected, as follows: *zatima* and *lubricipeda* ♀; *lubricipeda* ♂ and *zatima* ♀; *intermedia* and ditto ♀; *intermedia* ♂ and *zatima* ♀. All these gave *lubricipeda*, *intermedia* and *zatima* in varying proportions, except the cross *lubricipeda* ♂ and *zatima* ♀, from which only *zatima* resulted. A pair of *lubricipeda* from this fourth generation gave a brood of thirty-four *lubricipeda* and one extreme *zatima*. In all these successive broods, carried on into the fourth year from the date of the original pairing, there were no transitional forms between *lubricipeda* and *intermedia*.

"*Grammesia trigrammica*, Hufn., ♂, and ditto ab. *bilinea*, Hb., ♀.—The female *bilinea*, taken by Gross at Garsten in Austria, laid eggs of which the male parent was presumably normal *G. trigrammica*. Of the sixty-seven perfect insects that resulted thirty-eight were *trigrammica* and twenty-nine *bilinea*. There were no intermediates.

"*Angerona prunaria*, L., ♂, and ditto ab. *sordidata*, Fuessl. ♀.—This cross, procured by Zeller, gave seventeen *prunaria* and fourteen *sordidata*.

"*A. prunaria* ab. *sordidata* ♂, and *A. prunaria* ♀.—This cross, also obtained by Zeller, gave eighty-four of *prunaria* to sixty-eight of *sordidata*, i.e. as in the reciprocal cross, about 55 per cent. of the type and 45 per cent. of the aberration. In neither of these cases were there any intermediates.

"*A. prunaria* ab. *sordidata* ♂ and ♀.—Among a large brood reared from the eggs of a pair of normal *A. prunaria*, there appeared three males and two females of the aberration *sordidata*. From a pair of these Standfuss obtained thirteen *prunaria* (three males and ten females) and forty-two *sordidata* (twenty-four males and eighteen females). Again there were no transitional forms.

"*Amphidasys betularia*, L., ♂, and ditto ab. *doubledayaria*, Mill., ♀.—A female *doubledayaria* found by Steinert near Dresden produced seventy-five *betularia* (thirty males and forty-five females) and ninety *doubledayaria* (thirty-four males and fifty-six females). The male parent was doubtless an ordinary *betularia*. Two of the examples classed as *betularia* were darker than the normal, but otherwise no transitional forms occurred. Standfuss is of opinion that even these two need not be regarded

as owing their darker coloration to the cross, for it is well known that *A. betularia*, like *P. monacha*, is undergoing a gradually increasing melanism, which is probably protective, in many parts of its area of distribution. The extreme aberration *doubledayaria*, which thirty years ago was known only from Great Britain, has now appeared in Westphalia, the Rhine Provinces, Hanover, Gotha, and lastly in Dresden and Silesia. In several of these places it is becoming more and more common, and in at least some of them it is found side by side with the darkening forms of *A. betularia*, which, though of different nature and origin from the sport *doubledayaria*, are no doubt being preserved and brought up to its level (in aspect) under the influence of natural selection.

"*Boarmia repandata*, L., ♀, and ditto ab. *conversaria*, Hb., ♀. A large brood raised from the eggs of a pair of normal *B. repandata* contained three males and one female of the aberration *conversaria*. This female, which was paired with a wild male *B. repandata*, produced twenty-eight *repandata* (of which ten were males and eighteen females) and six *conversaria* (four being males and two females). The majority of the larvæ died during the winter. Here again intermediate forms were entirely absent.

"From the above experiments in the pairing of normal forms with aberrations and local races, performed or recorded by Standfuss, he arrives at the following conclusions:—

"1. When the normal form of a species (*Grundart*) is crossed with a gradually formed local race of the same species, the result is a series of intermediate forms.

"2. When the normal form is crossed with a sporadic aberration, the result in many cases is that the issue divides itself sharply between the normal form and the sport, intermediate forms being absent.

"Hence, according to Standfuss, the process of species-formation must be gradual; for when two distinct species are crossed, the issue does not split up into the two parental forms as in the case when one parent is a suddenly formed aberration. On the contrary, the behaviour of the issue of two distinct species is very similar in kind to that of a species crossed with a local race or variety which is being gradually established by the accumulation of slight changes. It would seem therefore that although an aberration or sport may be perpetuated by inheritance, it can never acquire distinct specific rank. No doubt, however, it may, if selected, eventually replace the original form of the species."

NEW SPECIES OF *SYNTOMIS* FROM CHINA.

By J. H. LEECH B.A., F.L.S., &c.

Syntomis xanthoma, sp. n.

Frons yellow; tegulae spotted with yellow at the base; head and thorax blackish, its posterior edge yellow; abdomen bluish black, with seven yellow bands. Antennae black, white towards tip above. Primaries black with a purplish reflection, and six yellowish hyaline spots (one subbasal, one in the cell with a minute one below it; beyond the middle one towards costa, one towards inner margin, and one between them; the latter is intersected by vein four). Secondaries of the colour of primaries, with yellowish hyaline patch at base, and an almost round spot just beyond the middle. Expanse, 40-44 millim.

Four male specimens from the province of Kwei-chow. Taken in June or July.

Habitat. Western China.

In one example the hyaline spot towards costa is small, and that below cell is absent.

Syntomis persimilis, sp. n.

Head, thorax, and abdomen black; frons and tegulae yellow; abdomen with six yellow bands. Wings black shot with purple. Primaries have five large hyaline spots, each of the three outer ones intersected by a nervule. Secondaries have two large hyaline spots, the outer one intersected by a nervule. Expanse, 36 millim.

Two female specimens from Ni-tou, and one from Omei-shan. Taken in June and July.

Habitat. Western China.

Allied to *S. perixanthia*, Hamp., but distinguished by the collar being black instead of yellow, and by the absence of yellow band on the metathorax. It is also a much smaller species.

Syntomis swinhoei, sp. n.

Allied to *S. actea*, Swinh., but the frons and head are black; the fronts of the tegulae and the metathorax are marked with yellow. The abdomen of male has seven yellow bands, and that of the female six. On the primaries the black along fifth vein between the discal bar and marginal border is narrower, as also is the marginal border of secondaries. Expanse, ♂ 35 millim., ♀ 36 millim.

A male specimen from Moupin, taken in June, and a female from Chia-ting-fu, captured in July.

Var. *obsoleta*, nov.

In this form the upper hyaline spot of the subapical trio is absent, and also the spot between the interno-median bar and the two submarginal spots; the border of secondaries is broader. Expanse 34 millim.

One female example from Ningpo, taken in July.

Habitat. Western China (type), North-eastern China (var.).

Syntomis dichotoma, sp. n.

Frons white; head and thorax black; abdomen bluish black, with four yellow bands, first and fourth broader than the others; antennæ black, becoming white towards tip. Primaries black with a purplish reflection; there are eight hyaline spots (one subdorsal, one nearly filling the discal cell, two subapical, and four below); in the male the third of the series of four is double; fringes marked with white below apex. Secondaries hyaline, broadly bordered with black, the inner edge of the border toothed. Expanse, ♂ 40-44 millim., ♀, 43-46 millim.

A long series from Moupin, taken in June.

Var. *concurrens*, nov.

Differs from the type in having the subbasal spot of primaries united with the fourth of outer series, as in *S. davidi*, which species it greatly resembles in the character of markings.

Four specimens from Kia-ting-fu, and one from the province of Kwei-chow, June and July.

Habitat. Western China.

Syntomis aucta, sp. n.

Closely resembles *S. davidi*, but the space between the costa and subcostal nervure is hyaline, and there is a small hyaline spot separated from the interno-median bar by the first vein; the black border of secondaries is rather broader, and the tooth larger; the tegulae are marked with yellow; the abdomen of the male has seven yellow bands, and that of the female six, all of nearly uniform width. Expanse, ♂ 34 millim., ♀ 36-38 millim.

One male specimen and two females from the province of Kwei-chow, taken in June or July.

Habitat. Western China.

Syntomis consequa, sp. n.

Female. Wings almost exactly identical with those of *S. rubrozonata*, but the frons is greyish, the collar is yellow, and there are six yellow bands on abdomen, the first of which is broad. Expanse, 28 millim.

One female specimen from Moupin, taken in June.

Habitat. Western China.

Syntomis euryzona, sp. n.

Frons yellow; head, thorax, and abdomen black, the latter with seven yellow bands, and the prothorax and metathorax each have a yellow patch. Antennæ black, apical third white. Primaries black, with the following yellowish markings: a bar in the interno-median interspace, with a spot above and a diffuse streak below its outer portion; a cuneiform spot in the discal cell, and four other spots beyond the cell; the second of these spots is also cuneiform, and separated from that in the cell by a black bar on the discoidals; all the hyaline markings are contiguous, and only separated one from the other by the

venation. Secondaries yellowish hyaline, with a broad black border which is toothed on its inner edge. Expanse, 43 millim.

One male specimen from Moupin, taken in June. Allied to *S. pascus*, Leech.

Habitat. Western China.

Syntomis leucoma, sp. n.

Frons, tegulae, and fore tibiae white; thorax and abdomen black, the latter with seven yellow bands, the last two of which are almost confluent. Primaries hyaline, venation black; there is a black spot at outer extremity of cell, and this is united by a bar with the broad apical portion of the black outer marginal border; the latter is toothed at veins 2 and 3; there is a curved black streak along inner margin. Secondaries hyaline, with black outer border which is broadest at apex. Expanse, 28 millim.

One male specimen from Omei-shan, taken in June.

Habitat. Western China.

SOME CHANGES IN THE NOMENCLATURE AND ARRANGEMENT OF BRITISH LEPIDOPTERA-HETEROCERA.

DR. SHARP says ('Insects,' pt. i. p. 171):—"It is estimated that about 250,000 species [of insects] have been already described and have had scientific names given to them, and it is considered that this is probably only about one-tenth of those that really exist. The classification in a comprehensible manner of such an enormous number of forms is, it will be readily understood, a matter of great difficulty. Several methods or schemes have since the time of Linnæus been devised for the purpose, but . . . most of them have fallen into disuse, and have only an historical interest. Even at present there exists, however, considerable diversity of opinion on the question of classification, due in part to the fact that some naturalists take the structure of the perfect or adult insect as the basis of their arrangement, while others prefer to treat the steps or processes by which the structure is attained as being of primary importance."

Entomological science, it must be admitted, has made enormous strides, and at the present time our knowledge of the Order Lepidoptera is far greater than it was, say, even ten years ago. We must, however, still ask ourselves whether it is yet advisable for us to break away from the old system of arrangement and to adopt either of the others that have been submitted to us. The time will come, no doubt, when a change will have to be made, but this will hardly be until a system has been devised that from its thoroughness shall command universal acceptance.

The majority of lepidopterists in this country are probably

satisfied with the classification and arrangement of British moths and butterflies now in use, which in the main accords with the system adopted on the continent. I have, however, been urged to publish a new edition of the 'Entomologist Synonymic List' giving all the changes in nomenclature introduced since 1884. Such a compilation would be expensive to print, and I am afraid would hardly meet with general support. It has occurred to me, however, that something provisional might be attempted, and I have therefore made the following rough jottings and extracts from 'A Synonymic Catalogue of Lepidoptera-Heterocera,' by Mr. W. F. Kirby, and 'Fauna, British India, Moths,' by Sir George F. Hampson; together with reference, where necessary, to 'A Handbook of British Lepidoptera,' by Mr. Edward Meyrick.—RICHARD SOUTH.

SPHINGES.

SPHINGIDÆ, Bdr.

(Subfamily ACHERONTIINÆ, Hampson; MANDUCINÆ, Kirby.)

ACHERONTIA ATROPOS, Linn.—Hampson and Meyrick retain this species in *Acherontia*, Ochs., but Kirby places it in *Manduca*, Hübn. (Tentamen, p. 1 (1810?)).

(Subfamily SPHINGINÆ, Hampson and Kirby.)

SPHINX CONVULVULI, Linn.—Included by Hampson in *Protoparce*, Burmeister, of which *rustica*, Walk., from Brazil is the type. Kirby sinks *Protoparce* in *Phlegethontius*, Hübn. (type *sexta*, Joh., from America), and *convulvuli* is No. 36 of the forty-one species referred by him to the genus. Meyrick refers to the species under *Sphinx*, Linn.

SPHINX LIGUSTRI, Linn.—The type of *Sphinx*, Linn.

SPHINX PINASTRI, Linn.—According to Kirby this is the type of *Hyloicus*, Hübn., which Hampson includes in *Protoparce*, Burm. Meyrick places this species in *Sphinx*, Linn.

(Subfamily CHÆROCAMPINÆ, Kirby, [CHÆO.] Hampson.)

CHÆROCAMPA ELPENOR, Linn., and C. CELERIO, Linn.—Hampson retains both species in *Chærocampa*, Dup., giving the first-named as the type; but Kirby sinks this genus in *Theretra*, Hübn. (type *T. nessus*, Drury), to which one hundred and fifteen species are referred, including *elpenor* (No. 1) and *celerio* (No. 31). Meyrick places both species in *Deilephila*, Ochs.

CHÆROCAMPA PORCELLUS, Linn.—Kirby gives this as the type of *Metopsilus*, Duncan (Nat. Libr. Brit. Moths, p. 154 (1836)). Some of the Indian species included in this genus by Kirby are referred by Hampson to *Theretra*, others to *Chærocampa*, one to *Ampelophaga*, and one to *Gurelca*! Meyrick refers *porcellus* to *Deilephila*, Ochs.

CHÆROCAMPA NERII, Linn.—The type of *Daphnis*, Hübn., as adopted as such by Hampson, but included by Meyrick in *Deilephila*, Ochs. Kirby does not indicate the type of *Daphnis*, but he places *nerii* first in this genus.

(Subfamily SMERINTHINÆ, Kirby.)

SMERINTHUS OCELLATUS, Linn.—The type of *Smerinthus*, Latr.

SMERINTHUS POPULI, Linn.—According to Kirby this species is the type of *Amorpha*, Hübn., but Meyrick leaves it in *Smerinthus*.

SMERINTHUS TILLÆ, Linn.—Kirby gives this as the type of *Dilina*, Dalm., and Meyrick also refers the species to this genus.

(Subfamily MACROGLOSSINÆ, Hampson and Kirby.)

MACROGLOSSA STELLATARUM, Linn.—Type of the genus.

MACROGLOSSA FUCIFORMIS, Linn., and *M. BOMBYLIFORMIS* Ochsén.—The first-named is the type of *Hemaris*, Dalm., according to Kirby, but Hampson gives *scabiosæ*, Zell., which Kirby refers, as a synonym, to *H. tityus*, Linn. = *bombylifomis*, Auct.

SESIIDÆ.

The eighth family according to Hampson's arrangement, but other systematists place this family in TINEINÆ. Meyrick, for example, makes it the first family (*Ægeriadæ*) in the division, immediately followed by the Gelechiadæ.

ZYGÆNIDÆ.

(Subfamily ZYGÆNINÆ, Hampson.)

(Subfamily ANTHROCERINÆ, Kirby.)

Note.—Meyrick refers this family, together with the Zeuzeridæ and the Heterogeneidæ, to PSYCHINÆ.

ZYGÆNA FILIPENDULÆ, Linn.—The type of the genus *Zygæna*, Fabr. (Hampson), but Kirby gives the same species as the type of *Anthrocera*, Scop., and *phegea*, Linn., as the type of *Zygæna*, Fabr.

The following is the synonymy of the British species according to Kirby:—

ZYGÆNA PILOSELLÆ (Ent. Syn. List.)

Anthrocera purpuralis, Müll. (*Sph. p.*), Zool. Dan. p. 116, n. 1345 (1776).

Zygæna pythia, Fabr. Gen. Ins. p. 275 (1777); Fuessly, Mag. Ent. i. p. 140, pl. 1, fig. 6 (1778).

Sph. pilosellæ, Esp. Schmett. ii. p. 186, pl. 24, figs. 2a, b (1781), ii. (2) p. 14, pl. 40, figs. 3–6, p. 32, pl. 44, fig. 10 (1789).

Sph. minos, Den. and Schiff. Verz. Schmett. Wien, p. 45, n. 1 (1776); Hübn. Beitr. Gesch. Schmett. ii. (1) p. 20, pl. 3,

- O (1790); Eur. Schmett. ii. fig. 8 (1797). *Zyg. m.*, Ochs. Schmett. Eur. p. 22 (1808); Herr.-Schäff. Schmett. Eur. p. 30, n. 10, figs. 13-15 (1846); Dup. Léop. France, Suppl. ii. p. 40, pl. 4, fig. 4 (1835); Boisd. Icones, ii. p. 41, pl. 52, fig. 5 (1834).
- Zyg. pluto*, Boisd. l. c. ii. p. 40, pl. 52, fig. 4 (1834); Dup. l. c. ii. p. 38, pl. 4, fig. 3 (1835).
- Zyg. heringi*, Zell. Stett. Ent. Zeit. v. p. 42 (1844).
- Var. a. *Z. pilosellæ* ab. *interrupta*, Staud. Cat. Lep. Eur. p. 45, n. 590d (1871).
- Var. b. *Z. nubigena*, Led. Verh. Zool. Bot. Ges. Wien, ii. p. 93 (1852); Birch. Ent. Mo. Mag. iii. p. 33, pl. 1, fig. 6 (1866).
- Var. c. *Zyg. p.* var. *diaphana*, Staud. Stett. Ent. Zeit. xxxi. p. 31 (1887).
- ZYGÆNA EXULANS, E. S. L.
- Anthrocera exulans*, Hochenw. and Reiner (*Sph. e.*), Bot. Reisen, p. 55, pl. 6, fig. 1 (1792); Esp. l. c. ii. (2) p. 17, pl. 41, figs. 1, 2 (1793); Hübn. figs. 12, 101 (1803?). *Zyg. e.*, Ochs. l. c. p. 40 (1808); Boisd. Mon. Zyg. p. 47, pl. 3, fig. 3 (1829).
- Var. a. *Zyg. e.* var. *subochracea*, White, Scott. Nat. i. p. 175 (1872).
- Var. b. *Zyg. vanadis*, Dalm. Vet. Acad. Handl. 1816, p. 223.
- ZYGÆNA MELILOTI, E. S. L.
- Anthrocera viciæ*, Fuessly (*Sph. v.*), Neues Mag. ii. p. 208 (1785).
- Sph. meliloti*, Esp. l. c. p. 10, pl. 39, figs. 1-8 (1789). *Zyg. m.*, Ochs. l. c. p. 43 (1808); Boisd. l. c. p. 51, pl. 3, fig. 5 (1829); Herr.-Schäff. l. c. p. 35, figs. 63, 78 (1846).
- Sph. loti*, Hübn. l. c. fig. 82 (1803).
- Sph. loniceræ* var., Esp. l. c. p. 195, pl. 25, fig. 3 (1781).
- Zyg. buglossi*, Dup. l. c. p. 138, pl. 12, fig. 4 (1835).
- Var. a. *Zyg. stentzii*, Freyer, Neu. Beitr. iii. p. 120, pl. 278, fig. 4 (1839).
- Zyg. meliloti* var. *stentzii*, Herr.-Schäff. l. c. p. 36, figs. 86, 87 (1846).
- Var. b. *Zyg. dahurica*, Boisd. Icones, ii. p. 57, pl. 54, fig. 7 (1834).
- Z. dorycnii*, Dup. l. c. ii. p. 135, pl. 12, fig. 3 (1834).
- Var. c. *Z. mel.* var. *confusa*, Staud. Stett. Ent. Zeit. xlii. p. 398 (1881).
- ZYGÆNA TRIFOLII, E. S. L.
- Anthrocera trifolii*, Esp. (*Sph. t.*) l. c. p. 223, pl. 34, figs. 4, 5 (1783); Hübn. l. c. figs. 99, 134, 135 (1818?). *Zyg. t.*, Ochs. l. c. p. 47 (1808); Boisd. Mon. Zyg. p. 54, pl. 3, fig. 7 (1829). *Anthr. t.*, Steph. Ill. Brit. Ent. Haust. ii. p. 108 (1828).

- Sph. pratorum*, De Vill. Ent. Linn. ii. p. 114, n. 60 (1789).
 Var. a. *Sph. glycirrhizæ*, Hübn. fig. 188 (1818); Freyer, l. ii. p. 116, pl. 164, fig. 8 (1836).
 Var. b. *Zyg. trifolii* var. *confluens*, Stand. Cat. Lep. Et p. 47, n. 611a (1871).
Sph. achilleæ et *filipendulæ*, Geyer, l. c. ii. figs. 165, 166 (184).
Zyg. t. var. *minoides*, De Selys, Mém. Soc. Liège, ii. p. (1845).
Zyg. scabiosæ, Haw. Lep. Brit. i. p. 74 (1803).
 Var. c. *Sph. orobi*, Hübn. l. c. fig. 183 (1818 ?).
 Var. d. *Anthr. meliloti*, Steph. l. c. p. 107 (1828); Westw. and Humphr. Brit. Moths, i. p. 29, pl. 6, figs. 15, 1 (1843).
 Var. e. *Zyg. syracusia*, Zell. Isis, 1847, p. 301. *Sph. s* Freyer, l. c. vi. p. 39, pl. 506, fig. 1 (1852). *Zyg. australis*, Led. l. c. ii. p. 71 (1852); Walk. Cat. Lep. He B. M. i. p. 84, n. 30 (1854).
Zyg. trifolii var., Ramb. Cat. Lep. And. p. 177, pl. 1, figs. 5- (1858-1866).
 Var. f. *Zyg. t.* var. *gracilis*, Fuchs, Stett. Ent. Zeit. xli p. 118 (1880).

ZYGÆNA LONICERÆ, E. S. L.

- Anthrocera loniceræ*, Schev. (*Sph. l.*) Naturf. x. p. 97 (1777); Fuessly, Mag. i. p. 140, pl. 1, fig. 1 (1778); Esp. l. c. p. 188, pl. 24, figs. 1, a, b (1781), ii. (2), p. 12, pl. 39, figs. 9-14 (1789); Hübn. l. c. figs. 7, 160 (1797-1818).
Zyg. l., Ochs. l. c. p. 49 (1808); Boisd. l. c. p. 56, pl. 3, fig. 8 (1829).
Zyg. fulvia, Fuessly, l. c. pp. 114, 139, pl. 1, fig. 1 (1778).
Sph. graminis, De Vill. Ent. Linn. ii. p. 115, n. 61 (1789).
Zyg. loti, Haw. l. c. p. 74 (1803). *Anthr. l.*, Steph. l. c. p. 109 (1828).
Anthr. trifolii, Wood. Ind. Ent. pl. 4, fig. 3 (1839).
 Var. a. *Zyg. l.* var. *eboracæ*, Prest, Ent. xvi. p. 273 (1883); Proc. Ent. Soc. Lond. 1883, p. xxviii.
 Var. b. *Zyg. l.* var. *major*, Frey. Lep. Schweiz, p. 67 (1880).
 Var. c. *Zyg. l.* ab. *citrina*, Spey. Stett. Ent. Zeit. xlviii. p. 334 (1888).

ZYGÆNA FILIPENDULÆ, E. S. L.

- Anthrocera filipendulæ*, Linn. (*Sph. f.*) Syst. Nat. i. p. 494 n. 32 (1758); Faun. Suec. p. 290 (1761); Esp. l. c. p. 138, pl. 16a-e (1780), p. 233, pl. 36, fig. 8 (1783).
Zyg. f., Ochs. l. c. p. 54 (1808); Godt. Léop. France, iii. p. 127, pl. 22, fig. 2 (1821); Boisd. l. c. p. 59, pl. 4, fig. 1 (1829); Curt. Brit. Ent. xii. pl. 547 (1835). *Anthr. f.*, Steph. l. c. p. 110 (1828).
Adscita aries, Retz. Gen. Sp. Ins. p. 35, n. 35 (1783).

- Var. a. *Sph. chrysanthemi*, Esp. l. c. ii. (2) p. 1, pl. 37, fig. 1 (1789).
 Var. b. *Sph. cytisi*, Hübn. l. c. fig. 26 (1797?).
 Var. c. *Anthr. hippocrepidis*, Steph. l. c. p. 109, n. 5 (1828); Wood. l. c. pl. 4, fig. 6 (1839).
 Var. d. *Zyg. fil.* var. *arctica*, Schneid. Tromsø Mus. Aarsh. iii. p. 85 (1880).
 Var. e. *Zyg. mannii*, Herr.-Schäff. l. c. vi. p. 44, figs. 109, 110 (1851-1852).
 Var. f. *Zyg. oxsenheimeri*, Zell. Isis, 1847, p. 303.
Sph. filipendulæ major, Esp. l. c. ii. (2) p. 19, pl. 41, fig. 4 (1789).
Zyg. transalpina, Boisd. l. c. p. 63, pl. 4, fig. 3 (1829); Icones, ii. p. 67, pl. 54, fig. 10 (1834); Dup. l. c. ii. p. 64, pl. 6, fig. 1 (1835); Herr.-Schäff. l. c. p. 42, figs. 61, 62 (1846).
 Var. g. *Zyg. ramburi*, Led. Wien. Ent. Mon. v. p. 151, pl. 1, fig. 10 (1861); Herr.-Schäff. Neue Schmett. p. 32, figs. 161, 162 (1861).
Zyg. gурda, Led. l. c. p. 152, pl. 1, fig. 9 (1861).
Zyg. mersina, Herr.-Schäff. l. c. p. 32, fig. 163 (1861).

BOMBYCES.

NYCTEOLIDÆ.

SAROTHRIPUS UNDULANS, Hübn.—Kirby places this species in the Lithosiidæ under the name *Nycteola revayana*, Scop., but Hampson refers it to the Noctuidæ, including it in the subfamily Sarrothripinæ as *Sarrothripa revayana*, Scop.

EARIAS CHLORANA, Linn.; HYLOPHILA PRASINANA, Linn.; and H. BICOLORANA, Fues. — These species belong to the Arctiid subfamily Nycteolinæ of Hampson's arrangement, while Kirby includes them in Cymbidæ, a family placed between the Arctiidæ and the Lithosiidæ.

NOLIDÆ.

NOLA, Leach, of which *cucullatella*, Linn., is the type, is the representative genus of Nolinæ, a subfamily of Hampson's Arctiidæ; he remarks that some of the forms of this group are hardly structurally separable from Sarrothripinæ, which he refers to the Noctuidæ. Kirby places *Nola* in the family Lithosiidæ, and adopts *albula*, Den. and Schiff., for *albulalis*, and *ærugula*, Hübn., for *centonalis*.

Meyrick refers *strigula*, Schiff., and *albula*, Hübn., to *Uraba*, Walk.; and *centonalis*, Hübn., and *confusalis*, H.-S., to *Ræselia*, Hübn.

LITHOSIIDÆ.

CALLIGENIA MINIATA, Forst.—Hampson and Kirby both give this as the type of *Mittochrista*, Hübn., and this genus is adopted by Meyrick for *miniata* and *senex*.

LITHOSIA MESOMELLA, Linn.—This is the type of *Cybosia*, Hübn., according to Kirby, who gives *Lith. lutarella*, Haw., as a variety of *C. mesomella*. Meyrick also uses *Cybosia* for this species.

LITHOSIA MUSCERDA, Hufn.—Kirby indicates this species as the type of *Samera*, Wallengren (Wien. Ent. Mon. vii. pp. 146, 147), but Meyrick retains it in *Lithosia*.

LITHOSIA SORORCULA, Hufn.—The type of *Systropha*, Hübn., which Hampson merges in *Lithosia*, Fabr. Meyrick leaves this species in *Lithosia*.

LITHOSIA COMPLANATA, Linn.—The type of *Lithosia*, Fabr.; *griseola*, Hübn., *lurideola*, Zinck., *sericea*, Gregs., and *lutarella*, Linn., all belong to this genus.

LITHOSIA DEPLANA, Esp.—Kirby sinks the name *deplana*, Esp., in favour of *depressa*, Esp., and indicates it as the type of *Pelosia*, Hübn.

LITHOSIA CANIOLA, Hübn.—The type of *Eilema*, Hübn. (Kirby), included in *Lithosia*, Fabr., by Hampson and Meyrick.

GNOPHRIA QUADRA, Linn., and **G. RUBRICOLLIS**, Linn.—*Quadra* is the type of *Æonistis*, Hübn., and *rubricollis* the type of *Gnophria*, Stephens.

EMYDIA CRIBRUM, Linn.—Kirby refers this species, as *cribraria*, Linn., to *Coscinia*, Hübn., the type of which genus is *striata*, Linn. = *grammica*, Linn. This genus is also used by Meyrick for both species.

EUCHELIDÆ.

DEIOPEIA PULCHELLA, Linn.—Kirby and Meyrick refer this species to *Utetheisa*, Hübn. (the type of which is *ornatrix*, Linn.), and the former places it in the Lithosiidæ. Hampson includes it, under the name *Deiopia pulchella*, in his Arctiid subfamily Lithosiinæ.

EUCHELIA JACOBÆÆ, Linn.—The type of *Hipocrita*, Hübn., according to Kirby, and placed by him in the Lithosiidæ. Meyrick refers this species to *Tyria*, Hübn.

(ARCTIDÆ, Kirby and Hampson.)

CALLIMORPHA DOMINULA, Linn., and **C. HERA**, Linn.—The first named species is the type of the genus *Callimorpha*, Latr., but Kirby sinks *hera*, Linn., as a synonym of *quadripunctaria*, Pod. (Mus. Græc. p. 89 (1761)), and makes it the type of *Euplagia*, Hübn. Meyrick retains *Callimorpha* for *hera*.

CHELONIDÆ.

(Subfamily ARCTINÆ, Kirby and Hampson.)

NEMEOPHILA RUSSULA, Linn.—The type of *Diacrisia*, Hübn., according to Kirby, who refers to it as *D. sannio*, Linn. Meyrick

together with *mendica*, Clerck, *urticæ*, Esp., and *lubricipeda*, Linn., in *Diacrisia*.

ANTAGINIS, Linn.—Kirby gives this as the type of *Arctia*, but Meyrick places the species in *Arctia*,

Linn., and *A. VILLICA*, Linn.—The latter species is in *Arctia*, Schrank; and Hampson also includes *caia*, which is probably an Indian form of *caia*, Linn., but Kirby gives *caia* as the type of *Hypercompa*, the latter species, and also *villica*, are referred to *Arctia*

FULIGINOSA, Linn.—The type of *Phragmatobia*,

(Subfamily SPILOSOMATINÆ, Kirby.)

SPILOSOMA MENDICA, Clerck.—The type of *Diaphora*, Stephens.

SPILOSOMA MENTHASTRI, Esp., and *S. URTICÆ*, Esp.—The first is the type of *Spilosoma*, Stephens; but as Kirby has *lubricipeda*, Linn., it may be useful to give his full synonymy of this, and also of the species usually referred to as *lubricipeda*, Esp. :—

S. lubricipeda, Linn. (*Bombyx l.*), Syst. Nat. i. p. 505, n. 47 (1758); Faun. Suec. p. 303 (1761). *Phalæna l.*, Scop. Ent. Carn. p. 208, n. 513 (1763).

Bomb. lubricipeda alba, Hufn. Berl. Mag. ii. p. 412, n. 25 (1766).

Phal. lepus, p., Retz. Gen. Spec. Ins. p. 37, n. 47 (1783).

Bomb. menthastri, Esp. Schmett. iii. p. 334, pl. 66, fig. 6-10 (1786); Hüb. Eur. Schmett. ii. figs. 152, 153 (1804 ?).

Euprepia m., Ochs. Schmett. Eur. iii. p. 354 (1810).

Chelonia m., Godt. Lép. France, iv. p. 362, pl. 37, fig. 5 (1822). *Spilosoma m.*, Steph. l. c. ii. p. 75, pl. 16, fig. 3 (1828).

Phal. erminea, Marsh. Trans. Linn. Soc. Lond. i. p. 70, pl. 1, fig. 1 (1791).

Bomb. mendica, ♀, Rossi, Faun. Etrusc. ii. p. 174, n. 1603 (1790).

Var. a. *Spil. walkeri*, Curt. Brit. Ent. ii. pl. 92 (1825).

Chel. menthastri, var., Godt. l. c. pl. 37, fig. 6 (1822).

Var. b. *Chel. luxerii*, Godt. l. c. p. 360, pl. 37, fig. 4.

SPILOSOMA LUBRICIPEDA, Esp.—The type of *Spilarctia*, Butl. (*Cistula*, Entom. ii. p. 39), which Hampson merges in *Spilosoma*. Kirby gives the following synonymy of the species :—

S. lutea, Hufn. (*Bombyx lubricipeda lutea*), Berl. Mag. ii. p. 412, n. 26 (1766).

Bombyx lubricipeda, ♂, Linn. Syst. Nat. i. p. 506, n. 47 (1758).

B. lubric. ♂, Linn. Faun. Suec. p. 303 (1761); *Bomb. l.*,

Chrysodina alutacea, n. sp.

Obscure æneous, above obscure cupreous, base of the antennæ fulvous; upper surface minutely granulate; thorax finely and subremotely, elytra distantly punctured in longitudinal rows. Length, 4 mill.

Of an obscure opaque cupreous colour; the head minutely granulate and extremely finely punctured; the antennæ very short, the lower six joints fulvous, the rest black, the penultimate four joints strongly widened, the terminal one more elongate but thickened; thorax about one-half broader than long, the basal margin broadly rounded and produced at the middle, the surface minutely granulate, finely and rather remotely punctured, the sides obliquely narrowed towards the apex, the basal margin with a row of closely placed stronger punctures at the sides; scutellum broad, its sides rounded, impunctate; elytra sculptured and punctured like the thorax, but the punctures widely placed and arranged in distant longitudinal rows, the last two interstices at the sides slightly convex; under side and legs very dark æneous.

Hab. Bolivia.

The entire very finely granulate upper surface of this species, giving it an opaque but submetallic appearance, will distinguish it from any other described *Chrysodina*. I have preserved the name given to it by Lefèvre, who had the insect for examination.

Chrysodina cupricollis, n. sp.

Blackish, the breast metallic green; head and thorax bright cupreous, strongly and subremotely punctured; elytra metallic green, strongly subgeminately, punctate-striate. Length, 4 mill.

Head minutely granulate, remotely but distinctly punctured; clypeus wedge-shaped, punctured like the head, its anterior edge oblique at the sides, emarginate at the middle; labrum and palpi piceous; antennæ black, the lower five joints more or less fulvous, the basal one metallic green above; thorax twice as broad as long, the sides obliquely rounded and narrowed in front, the surface rather remotely and strongly punctured, bright cupreous, the basal margin with a row of stronger punctures; scutellum broad, cupreous, impunctate; elytra much more strongly punctured than the thorax, metallic green, the basal portion without depression, the punctures anteriorly arranged somewhat in double rows, singly below the middle, the interstices flat and impunctate, below nearly black, the breast metallic green, the tibiæ slightly of the latter colour; tarsi piceous.

Hab. Rosario, Argentine Republic.

Of same coloration as *C. opulenta*, Lefèv., but nearly black below; the head and thorax of different sculpture; the antennæ differently coloured. Two specimens in my collection.

Chrysodina paraguayensis, n. sp.

Metallic bluish below, above metallic green; the basal joints of the antennæ fulvous; head and thorax subremotely and finely punctured;

- Esp. Sci. ... semi-regular rows, the last in
 Trans. ...
 Hübn. ... closely punctured; the epistome
 Ochs. ... margin very slightly concave
 Lep. ... to the base of the thorax, black,
 some ... point stained with piceous ab
Phalaena lepa ... thorax twice as broad as long,
 Var. a. ... narrowed in front, the surface finely
 (1781) ... interstices sparingly and still p
 p. 26, ... produced at the middle, the b
Bomb. radi ... punctures; scutellum much bro
radiata ... distinct transverse depression be
 Brit. ... serrate, the surface rather stron
 Var. b. ... rows, the outer interstice costate fr
 (6), vi ... under side dark blue, nearly
 ... sternum longer than broad, rugose, i

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peruana, n. sp.

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... granulate, rather closely and strong
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 ... broad as long, of the usual shape, th
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 ... about fifteen or sixteen rows, somewha
 ... interstice strongly costate below the middle
 ... blue, nearly impunctate; tarsi piceous

... similar coloration as *C. fulgurans*, Har.
 ... of the antennae much broader than in th
 ... colour, the punctuation of the thorax

Dentrocampa optata, n. sp.

... head and thorax greenish aeneous, opaque, spar
 ... obscure fulvous, opaque, distinctly punctate-

Hu
I b
M. Lei

... opaque, with a few fine punctures; the anterior
 ... appears straight; antennae black, the basal two joints

flavous below, terminal joints distinctly widened, scarcely longer than broad; thorax three times broader than long, the sides straight at the base, moderately rounded in front, the anterior angles not mucronate, the surface dull opaque greenish æneous, very sparingly punctured, the sides with some stronger punctures; scutellum metallic green; elytra wider at the base than the thorax, regularly convex, rather strongly and regularly punctate-striate, dull and opaque, fulvous, the interstices entirely impunctate; epipleuræ, the under side, and legs dark metallic greenish.

Hab. Brasils.

A species of very dull colouring, and somewhat silky appearance, allied to *D. æneo-lucens*, Stål, which is described as having the elytra "testaceo-pellucidis," and a distinctly punctured thorax.

Deuterocampta (?) irregularis, n. sp.

Black; the head with a small fulvous spot; thorax extremely finely and sparingly punctured; elytra fulvous, irregularly punctured in double and treble rows; terminal joint of the tarsi dentate. Length, 12-13 mill.

Head with a few fine punctures, black, the vertex with a small fulvous spot; ultimate joint of the palpi testaceous at the apex; thorax nearly three times broader than long, the sides straight and parallel at the base, rounded near the anterior angles; the latter rather produced, the disc very sparingly and finely punctured, the sides with some slightly larger punctures, black; scutellum triangular, black; elytra rather wider at the base than the thorax, entirely fulvous, rather strongly, closely, and irregularly punctured, the punctures here and there arranged in rows, although very indistinctly so; under side and legs black, the sides of the breast nearly impunctate; tibiæ only channelled near the apex, the claw-joint toothed at the apex; claws distant.

Hab. Bolivia.

This species scarcely fits into any of the groups of Stål's arrangement, and differs from almost any of its allies in the irregularly punctured elytra; the prosternum, however, scarcely differs from that of *Deuterocampta*, but the dentate claw-joint agrees with *Leptinotarsa*, from which it again differs in the non-sulcate tibiæ. Two specimens are contained in my collection. The species entirely resembles *Doryphora semifulva*, Jac., likewise from Bolivia, except in the structural characters.

Deuterocampta cruz nigra, Stål, var. *bimaculata*.

Piceous; the labrum, antennæ, and the legs fulvous; thorax finely punctured, the disc blackish, the sides broadly flavous; elytra finely punctate-striate, flavous, the suture, the lateral margins posteriorly, and a small round spot below the middle of each elytron greenish black. Length, 11 mill.

Head finely and rather closely punctured, piceous, the vertex with a fulvous spot; the clypeus and the labrum fulvous; antennæ only

extending to the base of the elytra, entirely fulvous, the terminal joints strongly transversely dilated and flattened; thorax twice as broad as long, the sides straight at the base, rounded anteriorly, the angles not produced, the middle of the disc finely and rather closely punctured, greenish black, this colour in shape of a broad transverse band which has the sides deeply concave, the latter bright flavous, nearly impunctate; elytra finely punctate-striate, the suture, a narrow stripe on the shoulders, the lateral margins and epipleuræ at the posterior half, and a spot below the middle near the sides greenish black.

Hab. Brasils. Oxford Museum collection and my own.

This variety, of which two specimens are before me, agrees in every particular with the typical form, except that the transverse narrow elytral band of the latter is here absent and replaced by a small round spot, which at first sight might suggest the specific distinction of the species; and as two exactly similar specimens are before me, I thought the variety deserving of another name, no other instance having ever come under my observation in regard to this species, the variety of which seems to be extremely rare.

DeuteroCampta sedula, Stål.

This insect I believe to be only a variety of *D. pustulicola* Stål, in which the narrow elytral stripes have disappeared; there is no difference in any other respect between the two insects.

SYNOPSIS OF THE NORTH AMERICAN BEES OF THE GENUS *STELIS*.

By T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

THE North American species of *Stelis* may be separated follows:—

- | | |
|---|----------------------------|
| More or less blue or green | 1. |
| Black, not at all blue or green | 3. |
| 1. Second recurrent nervure ending a little beyond tip of second submarginal cell; olive-green species. (Colo.) | <i>montana</i> , Cress. |
| Second recurrent nervure ending a little before tip of second submarginal cell; dark blue or blue-black species | 2. |
| 2. Length about 8 mm.; thorax strongly and sparsely punctured. (Calif.) | <i>subcarulea</i> , Cress. |
| Length about 6 mm.; thorax closely punctured. (Colo.) | <i>elegans</i> , Cress. |
| 3. Length about 10 mm.; markings red. (Ga.) | <i>australis</i> , Cress. |
| Markings yellow | 4. |
| Markings white or yellowish white | 5. |

4. Legs black, except knees and a line on anterior tibiae; wings tinged with fuscous, darker on costa; abdominal bands uninterrupted. (Calif.) *laticincta*, Cress.
 Legs yellowish, femora and tibiae behind partly black; wings fuliginous. (Indiana) *obesa*, Say.
 Legs entirely fulvo-ferruginous; wings subhyaline, costa broadly fuscous. (Tex., N.M.) *costalis*, Cress.
5. Length about 5 mm. 6.
 Length over 7 mm.; second recurrent nervure reaching second submarginal cell before its tip 8.
6. Pubescence of thoracic dorsum black. (Nev.) *interrupta*, Cress.
 Pubescence of thoracic dorsum whitish or griseous 7.
7. Abdomen with only six white spots. (Calif.) *sexmaculata*, Ashm.
 Abdomen with at least eight spots. (Pa., Ills.) *lateralis*, Cress.
 Abdomen with at least four slightly interrupted bands *federalis*, Smith.
8. Pubescence mostly black *rubi*, n. sp.
 Pubescence pale 9.
9. Densely punctured. (Colo.) *submarginata*, Cress.
 Sparsely punctured 10.
10. Abdominal bands broadly subemarginate at sides posteriorly. (Colo.) *monticola*, Cress.
 Abdominal bands not subemarginate at sides. (Canada, N.Y.) *nitida*, Cress.

Stelis lateralis var. *permaculata*, n. var.

♂. Length about $4\frac{1}{2}$ mm.; black, strongly punctured; abdomen with transverse subdorsal white marks on each of the first five segments, those on the fifth nearly obsolete, and similar lateral marks on the first three segments, making sixteen marks in all. Wings hyaline, slightly smoky on costa near apex, second recurrent nervure reaching second submarginal cell distinctly before its end. Pubescence all pale.

Hab. Santa Fé, New Mexico, July 7th (Ckll. 1839). Mr. C. Robertson records 16-spotted males of *lateralis* from Illinois, but does not state whether the venation was peculiar.

Stelis rubi, n. sp.

♀. Length about $8\frac{1}{2}$ mm., fairly robust, shining, strongly and closely punctured, black, with cream-coloured marks on the abdomen, viz. narrow bands on first and second segments, very narrowly interrupted in the middle, and transverse median stripes on third and fourth, that on the third about twice as long as that on the fourth. The band on first segment is gently curved downwards at the sides; that on the second is narrowed to a mere line sublaterally, broadening at the extreme sides. These markings are only very sparsely punctured, and so shine more than the rest of the abdomen. Pubescence sparse, black; mixed with the black on the lower half of the face is

some shorter silvery pubescence. Basal enclosure of middle segment smooth and shining, densely punctured along its base. Scutellum channelled at sides. Apical segment of abdomen dorsally keeled, the keel smooth and shining; apex produced to a very sharp point, with small but abrupt notch on each side. Venter with minute close punctures. Legs black, hind tibiae with a long apical spine, middle tibia with a pair of short spines. Anterior tarsi with some short orange brown pubescence on inner side. Tegulae black, punctured. Wings smoky, a darker shade in the marginal cell; nervures black, second recurrent nervure reaching second submarginal cell considerably before its apex; second submarginal cell conspicuously longer than first.

Hab. Seattle, Washington State, May 11th, 1897, at flower of *Rubus ursinus*. Collected by T. Kincaid.

Mesilla Park, New Mexico, U.S.A.: May 31st, 1898.

NOTES AND OBSERVATIONS.

TINEA VASTELLA.—In 'Nature' for June 9th last Mr. W. I. McCorquodale states that the horns of some antelope skulls that he received from West Africa were all "infested by singular, thin finger-like protuberances which seemed to grow from the horn." These he at first thought were fungi; but afterwards found them to be cocoons of *Tinea vastella*. A sketch of the skull and horns of a harte-beest, with the cocoons *in situ*, is given, and also separate figures of the cocoons, the latter drawn one-half natural size. Mr. McCorquodale says:—"A very interesting point with regard to the habits of this insect which has not yet been cleared up, but upon which I hope to be able to throw some light through the observations of officers now serving in Africa, is that it has been asserted to feed on the horns of living animals; and in support of this I will quote the following:—'Dr. Fitzgibbon, many years ago, while in Gambia, stated he was surprised at finding grubs enclosed in cases which projected from the horns of animals freshly killed, the blood not being yet dry, the carcasses of the animals being exhibited in the market-place.' This statement is recorded in vol. i. of the 'Proceedings' of the Dublin Zoological Society:—'In contradiction, Lieut.-Colonel Wenman Coke said he had shot large numbers of various species of horned animals in South Africa, but that he had never seen the horn of a living animal perforated by one of these larvae, although he had seen many dead horns infested by them. Colonel Coke is most confident that the larvae never attack a living animal; he says that had this been the case it could not have escaped his observation. Mr. Truman concurs in expressing great doubt as to the correctness of the theory that the larvae feed on the horns of living animals.' We have the strong evidence of Dr. Fitzgibbon, and might argue that as the fibrous substance of the horn undergoes little or no change at the death of the animal, there seems no reason why the moth should not deposit its eggs when the living animal is at rest, nor why the larvae should not penetrate the horn." I venture to assert as my own opinion, and that of many sportsmen from

whom I have made enquiries, that the larva does not feed on the horns of living animals; had this been the case, it would not have escaped the observation of some of our 'mighty African hunters.' Thus Dr. Fitzgibbon's statement stands alone; the question must, however, remain *sub judice*."

ERANA GRAMINOSA.—This beautiful native green Noctuid exhibits a range of variation equalled only by a few other endemic species of moths. The specimen figured by Hudson, in his 'Manual of New Zealand Entomology,' is not quite typical of the species, as it occurs at Oamaru in the North Otago district. I collected a fine series there twelve years ago; and sent a good group of them to the Colonial Museum at Wellington shortly afterwards. Amongst them were at least a dozen specimens exhibiting distinctive phases of variation or varieties equally well defined as the forms of *Hydræcia nictitans* figured by Mr. J. W. Tutt (Entom. xxi. 289). If a dozen distinctive forms were selected, and we were to begin with the darkest and end with the palest, Mr. Hudson's figure would range about fourth in the series. Recently I have seen a good series collected in the native vegetation at Wakauni, six miles seawards of Ashburton. Although not quite so variable as the Oamaru forms, there is considerable variation amongst them. The various shades of green exhibited by each variety are more distinct in some localities than in others.—
W. W. SMITH.

"**SNOWSTORMS IN JUNE.**"—Under this heading a writer in the 'Standard' (June 2nd), referring to the severe weather in North Hertfordshire and Bedfordshire, says:—"The unseasonable weather is proving disastrous to insect life, and scores of dead and stupified butterflies are lying about the garden." Can any reader of the 'Entomologist' corroborate this?

"**INSECT GRAFTING.**—A discovery which may lead to important results has been made by Mr. Henry E. Crampton, Instructor in Biology in Columbia University. Mr. Crampton has been studying the work of a German scientist named Born, and has made a practical test of some of his theories, with extraordinary results. He has experimented on the embryo of the butterfly at the period of its existence when it lies inactive in its cocoon, after its life as a caterpillar. Everyone has seen the grub spinning its delicate nest on a leaf or twig, and entering it, as into a grave, remaining there eating nothing and apparently dead for a few weeks; and then emerging from it a beautiful creature with wings. Mr. Crampton collected a number of these cocoons, and operated on their insensible occupants. He found that he could cut the comatose creatures in half and join the half of one to the half of another without affecting the life of either. The chrysalids so joined accomplished the usual period of their retirement and emerged from it as two butterflies, with wonderful combinations of colours and organisms, apparently none the worse for the operation which had been performed. Prof. Smith, of the New Jersey Experiment Station, who has made the facts of Mr. Crampton's work known, believes that the discovery will constitute an era in biological science. The principle has an endless variety in possible forms of application, and may eventually reach to higher orders of life. The possibility of continuing two natures

in a single living organism being once demonstrated, scientists perceive how far-reaching may be the effects of such experiments."

The above paragraph, from the 'Christian Herald,' is reprinted the June issue of 'Entomological News,' the organ of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

VESPA ORIENTALIS.—Some account of this insect, as a species widely distributed in Bible lands, may possibly prove interesting. In the first place, though almost identical with its British congener, *Vespa crabro* in point of colour, it may readily be distinguished from the latter insect in having a larger proportion of chestnut-brown covering the whole of the upper portion of the abdomen, and only the two lower segments consisting of yellow spotted with brown, instead of three or four as the case with *V. crabro*. Also, if there is any difference in shape, *V. orientalis* is rather the more slender of the two. Never having myself come across a nest of this species, I of course cannot judge of its composition, but infer that it may be of clay instead of woven from paling or hollow tree, after the manner of *V. crabro*, *V. vulgaris*, *V. germanica*, &c., when engaged in sawing with their mandibles the requisite materials for the preparation of their cells; and indeed, in the confines of the Egyptian desert there are no timber trees, as a rule, with the sole exception of the date palm, for any such purpose; but these Hymenoptera flit about the walls of sun-dried clay in the outskirts of Cairo, Heliopolis, &c., and also numerous frequent the bakers' shops in the bazaars. After my ascent by the southern staircase to the roof of the time-honoured Temple of Isis at Dendera (anciently Tentyra), on Dec. 24th, 1883, I found myself in a somewhat uncomfortable position, as the summit of the wall was fenced by a parapet and there was a drop of probably thirty feet on the outer, and possibly twenty feet on the inner, side of the wall, and the hornets then were clustered on the patches of clay on the outer wall of the little chapel of Isis on the roof, being disturbed in their depredations by our advance, began to fly wildly about our heads. The said clay cells were the work of the little tawny-coloured bee scientifically known as *Calico doma sicula*, and they have plastered not only the hieroglyphics, but one whole side of the exterior of the temple. I have three specimens of *V. orientalis* from the cliffs of Lycopolis that I visited on Dec. 22nd and doubtless the presence of *C. sicula* accounted for their being here also, as on p. 180 of my 'Nine Hundred Miles up the Nile' the following passage occurs:—"Nor must the wonderful labours of the hymenopterous insects be left unnoticed that have selected the western side of the cliff as doubtless the most sheltered for their abode, and completely covered it, in one particular spot, with masses of clay cells." Great interest attaches to the fact of the modern traveller finding *V. orientalis* and *C. sicula* side by side, as there can be little doubt but what these are the identical hornet and bee mentioned in Holy Writ. *V. orientalis* was also noticed at Minieh, Upper Egypt, in the outskirts of the town, and around its sugar factory, on Dec. 20th, cf. 'Nine Hundred Miles up the Nile,' pp. 120 and 122:—"Hornets were very abundant. Five days only from Christmas and the thermometer is 79° in the sun, and several hornets are settled on the ground

outside the mill, to regale themselves on the mingled molasses and water that drips from the waste-pipe." And p. 103, *à propos* of Helwân :—"Hornets are abundant."

In conclusion, the same indefatigable little insect (*Calicodoma sicula*, above mentioned) has covered nearly all the ancient carving of the hieroglyphics on the oldest obelisk in Egypt, that of Heliopolis (which Joseph must often have gazed on, as his father-in-law was priest of its temple), with the coating of its clay cells.—F. A. WALKER, D.D.; Dun Mallard, Cricklewood.

NOTES ON SILK-PRODUCING LEPIDOPTERA.—A pairing of long duration between *Antheraea pernyi*, male (Chinese oak silkworm), and *A. mylitta*, female, of India, took place on May 12th, 1893. On the 13th, 125 eggs were laid during the night, and 91 on May 14th, a total of 216 eggs. After many years' experience, I always found that the pairings of different species of Lepidoptera never had a good result unless the species are closely allied, like *A. pernyi* and *A. roylei*, or *Platysamia cecropia* with *P. gloveri* or *P. ceanothi*. However, the pairing above mentioned gave me this time a hope that I should be able to rear a hybrid *pernyi-mylitta*, but I was again disappointed. The ova were all fertile, the larvæ became fully developed, but they were unable to cut the shell of the egg. I extracted about two dozen larvæ from the eggs, and all were alive and active. The head of the larva was like that of *pernyi* and the body like that of *mylitta*.

Rhodia fugax. This most interesting Japanese species was bred successfully, and for the first time, in 1895. The ova, which I had received from Japan, began to hatch on May 1st. The larva, which is easy to rear, feeds on various species of *Salix*, and, like *Antheraea yama-mai*, it hibernates in the ovum state. One half of the larvæ (about fifteen) were reared in the house, the others on a willow in the garden. The larvæ bred in the house commenced their cocoons on July 1st, those bred in the garden about July 15th. A peculiarity of the *fugax* larva is that it squeaks when touched, or even if it is slightly disturbed. The cocoon, which has the same curious form as that of the Indian *R. newara*, is of a most beautiful green.

Hyperchiria janus. During the season of 1895 I received several lots of pupæ of this large Central American species. There were thirty cocoons in the second lot, and I kept them all for the purpose of rearing the larvæ. They arrived on July 5th, and all the moths emerged from July 7th to 14th, the number of females being larger than that of the males. Four or five pairings took place, yet none of the eggs of the various broods hatched, which was a very great disappointment. I am unable to account for this extraordinary and fatal result, the first of the kind I ever had witnessed, as the cocoons and the moths, which were in splendid condition, had not suffered from cold or any other cause, and the greatest care had been taken of the couples. A singular fact also is that the moths, with one exception, laid only a very small number of their eggs.

This year (1898) three Japanese silk-producers are being bred—*Caligula japonica*, *Rhodia fugax*, and *Antheraea yama-mai*. These three species are all in the ovum state during the winter. The eggs all hatched in May.—ALFRED WAILLY; Tudor Villa, Norbiton.

RUSINA TENEBROSA.—On June 11th I took a partially gynandrous specimen of *Rusina tenebrosa*. All the wings, the body, and right antenna are those of a normal male; but the left antenna and palpi are those of a female: the effect of which is to give the insect a curious "lop-sided" appearance. I took it on a gas-lamp at Winchester, after securing a fine specimen of *Dianthæcia conspersa* on the same lamp.—H. W. SHEPHEARD-WALWYN; West Downs, Winchester.

CAPTURES AND FIELD REPORTS.

COLLECTING AT NORTHWOOD, MIDDLESEX.—It may be of interest that *Argynnis euphrosyne* is now on the wing at Northwood, and in fine condition, though not plentiful. Other insects noticed are as follows:—*Pieris brassica*, *P. rapæ*, *P. napi*, *Euchloë cardamines*, *Vanessa urtica* (hybernated), *Lycæna alexis*, *Cænonympha pamphilus*, *Libellula depressa* (female only).—F. A. WALKER, D.D.; Dun Mallard, Cricklewood, N.W., June 7th, 1898.

AMPHIDASYD BETULARIA VAR. DOUBLEDAYARIA IN THE LONDON DISTRICT.—It may be of interest to place on record another instance of the occurrence of the melanic form of *betularia* as far south as East Dulwich, a specimen of the var. *doubledayaria* (female), taken on June 6th by Mr. Eric Arnold, having just been sent to me for identification. The captor, a young entomologist, found his specimen paired with a male of the ordinary form, but unfortunately did not attach any importance to the preservation of the living moth for the purpose of obtaining ova.—H. A. AULD; June 16th.

FIDONIA LIMBARIA = CONSPICUATA IN SUFFOLK.—Mr. A. W. Mera informs me that one example of this species was obtained in Suffolk towards the end of May last.—RICHARD SOUTH.

LEPIDOPTERA AT OXSHOTT.—On June 7th *Pleurota bicostella* was far more abundant than usual on the heath, and *Scoparia ambigua* equally common on tree-trunks. *Tephrosia punctularia* was also plentiful on birch-trunks, and occasionally *Coremia designata*, *C. unidentaria*, *Melanippe sociata*, and *Zonosoma pendularia* were observed on the trees. One example of *Eupisteria oblitterata* (= *heparata*) and one of *Zonosoma punctaria* were also obtained. Tortrices, with the exception of *Catoptria ulicetana*, were scarce; the only other species seen were *Eupæcilia nana* (one), *Phoxopteryx uncana* and *Tortrix ministrana*. Larvæ of the pine-feeding *Retinia* were rarely met with, and neither larvæ nor pupæ of *Tortrix piceana* could be detected.—RICHARD SOUTH.

DEILEPHILA LIVORNICA AT ST. AGNES, SCILLY.—I have recently received a fine specimen of *D. livornica* from the island of St. Agnes, Scilly, which Mr. G. W. Brown kindly sent me, with the information that he captured it on the lantern of the lighthouse, just before sunrise on May 27th last. He also states in his letter, "I think I saw just such another on the lantern about two years ago." With the exception of a slight rub on the left primary and thorax, hardly noticeable, the specimen is in perfect condition.—F. W. FROHAWK; June 18th, 1898.

VANESSA ANTIOPA AT NORWICH.—A fine specimen of *V. antiopa* was captured just outside this city on Sunday, May 22nd, by Mr. Butler. LADDIMAN; Norwich.

FIELD MEETING OF THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—The second field meeting of the season was held on Saturday, June 11th, at Reigate. Sixteen members and two friends left Cannon Street Station by 2.17 train; and on their arrival at Reigate were met by three other members, making the total attendance twenty-one. On leaving the station yard the "Pilgrims Way" was taken to the "Downs," which are reached by a walk of about half a mile; and the afternoon was spent on the portion of the hill-side towards Betchworth. On returning a substantial tea was served at the Railway Hotel; and the homeward railway journey commenced a little before nine o'clock. The weather was all that could be desired for a country ramble, the heat of the brilliant sunshine being tempered by a light northerly breeze; but the predominance of the latter and lack of the former during the preceding week had not been conducive to the capture of a large number of species on even so promising a day. Some fifty species of Lepidoptera were, however, noted. These were as follows:—*Pieris brassicae*, *P. napi*, *P. rapae*, *Euchloë cardamines*, *Gonopteryx rhamni*, *Pararge megara*, *Vanessa cardui*?, *V. urticae*, *V. atalanta*, *Ctenonympha pamphilus*, *Polyommatus phlaeas*, *Thecla rubi*, *Lycena icarus*, *L. minima*, *L. astrarche*, *L. argiolus*, *L. bellargus*, *Syrichthys malva*, *Nisoniades tages*, *Hepialus lupulinus*, *Zygana filipendula* (pupæ), *Setina irrorella*, *Bombyx rubi*, *Euchelia jacobae*, *Plusia gamma*, *Cucullia verbasci* (larvæ), *Phytometra viridaria*, *Euclidia mi*, *E. glyphica*, *Rumia luteolata*, *Venilia maculata*, *Eupithecia vulgata*, *Acidalia remutata*, *A. ornata*, *A. subsericeata*, *Ematurga atomaria*, *Bapta temerata*, *Melanippe montanata*, *M. rivata*, *M. sociata*, *Campptogramma bilineata*, *Anaitis plagiata*, *Mimæseoptilus phæodactylus* (larvæ), *Scoparia dubitalis*, *Crambus pratellus*, *C. hortuellus*, *C. pascuellus*?, *Penthina gentiana*. Next field meeting: Chatham, July 9th.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—June 1st, 1898.—Mr. R. Trimen, F.R.S., President, in the chair. Prof. B. Grassi, M. Hippolyte Lucas, and Dr. August Weismann were elected Honorary Fellows; and Mr. C. H. A. Brooke, of 67, Holland Park Avenue, Kensington, W., and Mr. G. B. Dixon, of St. Peter's Road, Leicester, were elected Ordinary Fellows of the Society. Mr. P. B. Mason exhibited a specimen of the rare *Lathridius filum* from his own herbarium. It had been previously taken at Edinburgh by McNab, and he understood that an example had been found in a sealed envelope containing *Marchantia* from Franz Josef Land. Mr. J. J. Walker exhibited a singular blue variety of *Carabus monilis*, Fabr., resembling in colour *C. intricatus*, and taken at Iwade, Kent, in floor-rubbish in May. Mr. Merrifield forwarded for exhibition from Riva, on the Lago di Garda, larvæ of the "Corsican form," var. *ichnusa* of *Aglais urticae*. Mr. G. C. Champion called attention to Mr. A. Somerville's recently-published sheet of the County and Vice-county divisions of the British Isles for biological purposes, and a discussion ensued thereon. Papers were communicated by Sir G. F. Hampson, Bart., on "The Moths of the Lesser Antilles," and by Mr. J. H. Leech, on "Lepidoptera-Heterocera from Northern China, Japan, and Korea."—W. F. H. BLANDFORD, Hon. Sec.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—May 26th, 1898.—Mr. J. W. Tutt, F.E.S., President, in the chair. Mr. Edwards exhibited a living specimen of a scorpion found by himself in the neighbourhood of Cannes, where it was abundant. It fed readily upon young cockroaches. Mr. West, of Greenwich, a series of the smallest British water-bug, *Microvelia pygmaea*, and stated that it ran readily over the surface of the water. Mr. Turner, a life-history series of *Coleophora genistæcolella* from Carlisle, showing imagines, and cases made by the larvæ on the food-plant, *Genista anglica* (the petty whin). He stated that the larvæ were noticed at Oxshott on May 21st, during the field-meeting.

June 9th.—The President in the chair. Mr. Lucas exhibited coloured drawings of *Libellula fulva*, showing details. Mr. Bishop, a bred specimen of *Brephos parthenias*, having a gap in the wing due to an injury to the pupa. The gap was ciliated. He also exhibited specimens of *Thecla rubi*, and remarked on the variability of the androconial marks in this species, while in all the rest of the genus they were notably constant; specimens of *Rumia luteolata*, showing considerable range of variation in the red spotting; and larvæ of *Taniocampa munda*, *T. incerta*, and *T. stabilis*. Mr. Tutt, ova of *Hepialus lupulinus*, and said that under a glass they looked like little black shoes. Mr. West, of Greenwich, series of the Hemiptera-Heteroptera, *Trapezotus agrestis* and *Tropistethus holosericeus*, obtained by shaking moss in Headley Lane. Mr. Shortridge Clarke gave an account of a remarkable occurrence of thousands of larvæ and imagines of *Caradrina quadripunctata* (*cubicularis*) in a large hay-store in the Isle of Man.—HY. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—May 16th, 1898.—Mr. G. T. Bethune-Baker, President, in the chair. Mr. R. C. Bradley showed a Trypetid taken on a window in his house at Sutton; it had been seen by Mr. G. H. Verrall, who said it was *Rhacochlena toxoneura*, a genus and species new to Britain and very rare. Mr. P. W. Abbott, *Taniocampa opima* and a series of *T. stabilis*, in which the orbicular and reniform tend to coalesce; in one specimen they do coalesce on the right wing but not quite on the left; all from Wyre Forest. Mr. G. T. Bethune-Baker, the remainder of his collection of the genus *Colias*, also *Megastoma* and *Rhodocera*; and pointed out the manner in which *Colias* ran naturally into *Rhodocera* through *Megastoma*. *centralamericana* has a hook tip, but is still like *Colias*; *M. eurydic* very like *centralamericana* in the male, but the female is like *Rhodocera rhamni*, pale with a good hook tip.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

OBITUARY.

It is with much regret that we have to record the death of the following distinguished Entomologists.

JOSEPH ALBERT LINTNER.—Dr. Lintner, State Entomologist, New York, died in Rome on the 5th of May last, at the age of seven-
six. He was the son of a Lutheran clergyman, and was born
Schoharie in New York State. He had to make his own way in t

world; and for thirty-one years pursued a mercantile career. Meanwhile, however, he was devoting his leisure moments to the more congenial occupation of the study of natural science, and especially of entomology. In 1868 he became Curator of the New York State Museum; and in 1880 the office of State Entomologist was created, and he was offered and accepted the appointment, which he held until his death. He was entomological editor of the 'Country Gentleman' newspaper; Fellow of many Learned and Scientific Societies both in America and Europe; President of the Department of Natural Science in Albany Institute, New York, since 1879; President of the Entomological Club and of the Association for the Advancement of Science. His mercantile career naturally equipped him for the economic side of entomology, which his State office required; and in making scientific research of actual and practical value he was eminently successful. His Twelfth Report has just been issued, and gives a fresh illustration of the practical nature of his work. New York State has been fortunate in having for its official entomologist not only a man of high acquirements and of wide and liberal views, but one whose sympathies were with the farmers, gardeners, and fruit-growers in their struggles against injurious insects. He had been looking forward to his tour in Europe as giving opportunity of making personal acquaintance with many entomological colleagues. He spared no pains in communicating his great knowledge to all pursuing any special subject who sought his aid. He was never known to give offence; never was an unkind word said by him or of him. Always ready to encourage the work of others not occupying so high a position as himself and to stamp what was sound and good with his authoritative approval, determined also that the original worker should have credit for his work, his removal by death will be deplored by all who have been brought into contact with him.

OSBERT SALVIN.—Mr. Salvin died on June 1st last, at his residence, Hawksfold, near Haslemere. The second and only surviving son of the late Mr. Anthony Salvin, the well-known architect, he was born in 1835, and received his education at Westminster and Trinity Hall, Cambridge, whence he graduated as a Senior Optime in the Mathematical Tripos of 1857. Immediately after taking his degree he, together with Mr. W. H. Hudleston (then Simpson), joined Mr. (now Canon) Tristram in his natural history exploration of Tunis and Eastern Algeria, where they passed five months. In the autumn of the same year Mr. Salvin proceeded to Guatemala, where, chiefly in company with the late Mr. G. U. Skinner, the celebrated collector of orchids, he stayed till the middle of 1858, returning to Central America (henceforth always to be associated with his name) about twelve months later. He again went out in 1861, accompanied by Mr. Frederick Godman, and continued the explorations he had already begun; but was home again in 1863. In 1865 he married Caroline, the daughter of Mr. W. W. Maitland, of Loughton in Essex, and with her subsequently undertook another voyage to Central America. In 1874, on the foundation of the Strickland Curatorship in the University of Cambridge, he accepted that office, which he filled until 1883, when, on his father's death, he succeeded to the property at Hawksfold, and moved thither, though there was hardly a week in which he did not

pass some days in London; for, with Mr. Godman, he had conceived the idea of bringing out a 'Biologia Centrali-Americana,' being a complete natural history of the countries lying between Mexico and the Isthmus of Panama. This gigantic task, by far the greatest work of the kind ever attempted, taxed all their united efforts and those of the many contributors they enlisted, and is still in progress. Before beginning this, Mr. Salvin had edited the third series of 'The Ibis,' of which he was one of the founders; and had brought out a 'Catalogue of the Strickland Collection' in the Cambridge Museum. He contributed also the Trochilidæ (humming-birds) and Procellariidæ (petrels)—on which last group he was the acknowledged authority—to the British Museum 'Catalogue of Birds'; and almost his latest labour was that of completing and arranging the late Lord Lilford's 'Coloured Figure of British Birds'; while the Royal Society's 'Catalogue of Scientific Papers' enumerates forty-seven published by Mr. Salvin alone, twenty-three by him and Mr. Godman jointly, and fifty-four by him and Mr. Selater—all before 1884. Mr. Salvin was a Fellow of the Royal, the Linnean, the Zoological, and the Entomological Societies, on the councils of all of which he frequently served; and it may be truly said that there were few naturalists whose opinion was more often sought for his advice was generally sound. His figure was well known at the Athenæum Club; and last year he was elected an Hon. Fellow of his old college. He will be greatly missed by a large circle of friends, to whom his quiet and unassuming manners greatly endeared him.

WILLIAM MILES MASKELL.—Mr. W. M. Maskell, Registrar of the New Zealand University, died on May 1st, aged fifty-eight years. He was born in Hampshire, England, and was educated at the Catholic College of St. Mary, Oscott, and also in Paris. After leaving school he entered the army, and served for three years in the 11th Infantry, now known as the Devonshire Regiment. He went out to New Zealand in 1860 in the ship 'William Miles,' and landed at Lyttelton the same year. In Canterbury he worked for some time on sheep stations until, having gained sufficient experience, he took up a sheep run on his own account in Kaikoura in the Marlborough district. In 1864 he returned to Canterbury; and for the eight years following he was farming at Sefton. He was elected a member of the Privy Council in 1865 and kept his seat until 1875, when the General Assembly took over the reins of Government. In 1874 he was appointed Provincial Secretary and Treasurer of Canterbury; the Hon. J. T. Peacock being at the same time Secretary for Public Works. Mr. Maskell was appointed in succession to Mr. E. Jolly, who at that time represented Selwyn. On the formation of the New Zealand University he was appointed Registrar, and during the time that the Hon. J. Tancred held the position of Chancellor he resided in Christchurch; but when Sir James Hector assumed the Chancellorship Mr. Maskell went to Wellington, where he has lived ever since. Mr. Maskell was a widely-read man, who took keen interest in scientific matters. He was a prominent member of the Philosophical Institute both in Christchurch and Wellington, and in fact assisted in the foundation of the Institute. He was well known as an entomologist; and some of his papers on Coccidæ, of which family he was recognised an authority, were widely published.

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A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC RHYNCHOTA).

By G. W. KIRKALDY.

THE study of British waterbugs has been much neglected, even by those entomologists who have given a certain amount of attention to the land-inhabiting species, and it has been suggested to me by our editor that a few introductory remarks upon their collection and preservation, upon some salient points in their structure, and upon their metamorphoses and habits, may be of interest to British collectors.

COLLECTING, &c.

The apparatus required is simple, *viz.* a net, a killing-bottle, forceps, some glass tubes and small tin boxes, a pocket-magnifier, a piece of rag, and various odds and ends that experience will dictate from time to time. The net should be of good stout material (of sufficiently wide mesh to allow the water to escape readily, while retaining such small insects as *Micronecta* (*Sigara*) and *Plea*), not too long, with the bottom rounded off at the corners; this last point is important. The frame of the net should be strong; I myself use a "salmon landing-net" ring, jointed in three places, so that when the net is removed and squeezed dry, the ring (which is, during use, screwed into a strong stick) can be folded and placed in the satchel or bag when starting for home. Care should be taken to wipe the ring and stick-socket quite dry before packing.

The long-legged "pondskaters" (*Hydrometridæ*) may be captured by a quick stroke of the net, scarcely entering the water at all. *Velia* and some species of *Gerris* are generally found on little inlets of water close to a running stream, or on

pass some days in London, the idea of bringing a complete natural history of the Isthmus of Panama to the kind ever attended by many contributors. In doing this, Mr. Sclater was one of the Strickland Collection, also the Trochilidae, which last group of Museum 'Catalogue' of completing an of British Birds. Papers' enumerated three by him and Sclater—all but Linnean, the councils of all that there were for his advice. Athenæum College. old college. whom his qu

WILLIAM New Zealand was born in College of St entered the known as 1860 in the year. In having given account in to Canterbury Sefton. kept his reins of and Tro same time in success. On the Registrar position Hector where who t memb Welli He w Cocci publi

... on to stagnat
... *Gerris*, *Hydrimet*
... *coris* (*Naucoris*), an
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... with the Canadian pen
... *Anacharis canadensis*
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... of small bugs (*Pla*
... might otherwise escap
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... adhered in consequenc
... pond.

... prey resting on the bottom
... collector should therefore
... or mass of smaller plants
... the mud, and with a swift
... surface. The net should ther
... water filtering through the
... particles of mud. When
... most of the mud will have
... the net will now be ready for

... in swift running streams and
... or two species of *Corixa* are
... brackish dykes near the sea;
... but few weeds, and with a
... elm, or beech leaves, I have
... these places that the crustacean
... and I always accept their
... an indication of the absence of
... water are unlikely to occur in ponds
... their condition upon extraction
... watersnails, enveloped in the spawn,

... *annairii* (whose exact systematic
... been discovered at various seaside
... (but not, I think, in Scotland)
... of rock not far above low water.
... have a wide distribution. Some species
... are found only in the elevated
... occasional stragglers occur in the
... *cuculonica* (*cognata*)—is known to
... though distributed there from Loch

Leven to the Shetlands. Collectors, especially those residing in North and West Scotland, in West Ireland, and in Wales, will do well to study the waterbugs of their neighbourhood, as no doubt such examination will extend our knowledge of the distribution of a number of rare species, and add new species to our fauna, and possibly to science.

One great advantage which the student of aquatic Rhynchota possesses over collectors of (for example) Lepidoptera is that weather should make little difference to him. Should he be so minded, he may sally forth during pouring showers or on a dull cloud-obscured day, and find little or no diminution in the number and quality of his captures. Collecting may be done, moreover, all the year round. Hydrometridæ appear to hibernate in the perfect state; the imagines being found from August to June, the larvæ from about May to August. *Micronecta* hibernates in the larval state (according to Buchanan White), but I have never found it then. All the other waterbugs passing the winter fully developed, they may be looked for in the latter state from about the end of July to the beginning of June, or even later. The ova are deposited in April or May, as a rule, and the various larval stages are passed through from May to the end of July; but all these dates overlap and vary considerably from year to year. April, May, August, and September are perhaps the most productive and the most pleasant months in which to collect, although certain species are more abundant in the earlier months of the year. *Notonecta*, *Corixa*, &c., may be seen during the winter frozen and huddled together in masses under the ice; whilst Hydrometridæ pass the same season under moss or stones, often some distance from water. Waterbugs are by no means of a solitary disposition (except perhaps the Nepidæ), but usually occur together in some numbers,—several species of *Corixa* appearing to move in small shoals; so that when the collector finds, either at the collecting-place or during a more careful examination subsequently, that he has chanced upon a rare or local species, he may work the same locality again, with very good hopes of success.

With the exception of the Nepidæ, which are exceedingly prone to die in captivity, waterbugs are very easily kept in aquaria, provided that reasonable care be taken. Unless, however, an abundance of suitable food is provided, they will feed upon each other. Separate aquaria (fair-sized jam jars answer the purpose very well) should be kept for the propagation of entomostracous crustacea (*Cyclops*, *Daphnia*, &c.) for the nourishment of Corixidæ and the small larvæ of the larger species; while *Notonecta* and the other large species should be well supplied with larvæ of Ephemeridæ, *Sialis*, small fishes, &c. Hydrometridæ will feed upon flies or small pieces of raw meat.

the stream itself. The filling-bottle is our next wish to retain for the *Corixa* can be seen on the surface for a "sweeping" of the weedy pond (weed, *Elodea* the contents of the white mackintosh be shaken and portable white *Micronecta*, &c. notice from between two of the removal

Nepa and of the pond, place the net about an inch twisting movement be filled with meshes and can this has been escaped, and examination.

Waterbugs in small stagnate scarcely found small ponds, perpetual bott not found produced. *Asellus* is to presence in waterbugs. infested with from a mass is not very

One small position is localities in under stone. As a rule of *Gerris* at portions of south; one science only

STRUCTURE AND ARRANGEMENT OF THE HETEROCERA.

(1892.)

Psychidæ and Drepanidæ. If the Heterocera could be this he is in agreement with his division MICROPTERYGINA. family included in 'Sphingidæ' sinks *velleda* as a synonym *Spec. Ins.* p. 44 (1783).

Trypanidæ, Kirby).

linear arrangement this family of the Tineidæ.

Kirby retains the specific name and gives it as the type of *Trypanidæ*. p. 326 (1866). Meyrick adopts *Trypanidæ*, at the end of his division

Hahn.—Both Kirby and Hampson *Trypanidæ*, Newm., for this species, although *Dup.*; but the latter name had been in this, but places the family

COCHLIOPODIDÆ (LIMACODIDÆ, Kirby).

HETEROGENEA LIMACODES, Hufn., and H. ASELLA, Schiff.—The latter species is the type of *Heterogenea*, Knoch, according to Kirby, who changes the specific name to *cruciata*, Knoch. The same author sinks *limacodes*, Hufn., as a synonym of *avellana*, Linn., and indicates it as the type of *Apoda*, Haworth. Meyrick employs both genera in the same sense as Kirby, but adopts *Heterogeneidæ* as the name of the family which he refers to his division PSYCHINA.

LIPARIDÆ (LYMANTRIIDÆ, Hampson).

PORTHESIA SIMILIS, Fuessl.—Kirby indicates this species as the type of *Leucoma*, Hübn. (Tentamen. p. 1), but Hampson and Meyrick adopt *Porthesia*, Stephens.

PORTHESIA CHRYSORRHÆA, Linn.—The type of *Euproctis*, Hübn., a very widely-distributed genus.

LEUCOMA SALICIS, Linn.—The type of *Stilpnotia*, West. and Humphr.

OCNERIA DISPAR, Linn.—The type of *Porthetria*, Hübn., according to Kirby. Hampson sinks this genus in *Lymantria*, Hübn., whilst Meyrick refers *dispar* to *Ocneria*, Hübn.

PSILURA MONACHA, Linn.—The type of *Lymantria*, Hübn. Meyrick includes this species in *Ocneria*, Hübn.

DASYCHIRA FASCELINA, Linn., and D. PUDIBUNDA, Linn.—According to Kirby *fascelina*, Linn., is the type of *Orgyia*, Ochs., and *pudibunda* the type of *Dasychira*, Hübn., but Hampson gives *antiqua*, Linn., as the type of the first-named genus. Meyrick places both species under *Dasychira*, Hübn.

ORGYIA ANTIQUA, Linn., and O. GONOSTIGMA, Fb. (Linn., teste Kirby).—These species are referred by Kirby to *Notolophus*, Germ. (Syst. Gloss. Prodr. p. 35 (1812)), and he indicates *antiqua*, Linn., as the type of the genus. Hampson includes *Notolophus*, Germ., in *Orgyia*, Ochs., and Meyrick employs the last named for both species.

BOMBYCIDÆ (LASIOCAMPIDÆ, Hampson and Kirby).

ERIOGASTER LANESTRIS, Linn.—The type of *Eriogaster*, Germ. (Prod. Syst. Lep. p. 6 (1811)).

BOMBYX NEUSTRIA, Linn., and B. CASTRENSIS, Linn.—The last-named species is the type of *Clisiocampa*, Stephens, and *neustria* is referable to the same genus.

BOMBYX RUBI, Linn.—Kirby gives this as the type of *Macrotlhyllacia*, Ramb. (Cat. Léop. And. ii. p. 358 (1866)). The only

other species included in the genus is *M. psidii*, Sallé, from Mexico and Central America. Meyrick places *rubi*, Linn., in *Eriogaster*, Germ.

BOMBYX QUERCUS, Linn., and **B. TRIFOLI**, Esp.—Kirby refers both these species to *Lasiocampa*, Schrank. (*Fauna Boica*, ii. (2) pp. 147, 154 (1802), and indicates the first named as the type of the genus. Ten named forms of *quercus* and seven of *trifoli* are enumerated. Meyrick also adopts *Lasiocampa*.

ODONESTIS POTATORIA, Linn.—Hampson retains this species as the type of *Odonestis*, Germar, but Kirby considers *Bombyx pruni*, Linn., to be the type of that genus, and refers *potatoria* to *Philudoria*, Kirby=*Odonestis*, Steph. & Walk.

LASIOCAMPA QUERCIFOLIA, Linn., and **L. ILLICIFOLIA**, Linn.—The first named is the type of *Gastropacha*, Ochs. Kirby refers *ilicifolia* to *Phyllodesma*, Hübn., of which genus he indicates *las. suberifolia*, Dup., as the type.

ENDROMIIDÆ.

Kirby includes *Endromis versicolor*, Linn., in Bombycidæ, and it is the only representative of the family, as now restricted, occurring in Britain. If Hampson, however, is followed, and Endromiidæ allowed to rank as a separate family, we have no example of Bombycidæ in this country, or even in Europe, unless we count *B. mori*, Linn., which is the type of the genus *Bombyx*, Linn., and which, I believe, occurs in a semi-wild state in the South of Europe. Meyrick refers the family (Endromididæ) to his division LASIOCAMPINA, in which he also includes "Drepanidæ."

DREPANULIDÆ.

DREPANA, Schrank, = **PLATYPTERYX**, Laspeyres.—Hampson gives *falcatoria*, Linn., as the type of *Drepana*, Schr., but Kirby includes this species together with *harpagula*, Esp., *cultraria*, Fab., and *binaria*, Hufn., in *Platypteryx*, Lasp., and indicates the latter species as the type of the genus. The type of *Drepana*, according to Kirby, is *glauca*, Scop. (*spinula*, Schiff.), which most authors, including Hampson, consider to be the type of *Cilix*, Leach. *Falcaria*, Haworth (Lep. Brit. ii. pp. 147, 152 (1809), is adopted by Kirby and Meyrick for *lacertinaria*, Linn.; and the last-named author also includes *falcatoria*, Linn., in Haworth's genus, whilst he refers *harpagula*, *binaria*, and *cultraria* to *Drepana*, Schr.

DICRANURIDÆ (NOTODONTIDÆ, Hampson and Kirby).

DICRANURA, Latreille, = **CERURA**, Schrank.—Hampson gives *vinula*, Linn., as the type of *Dicranura*, Bois. (Latr.), and *furcula*, Schr., as the type of *Cerura*, Schr., = *Harpyia*, Ochs. Kirby

merges *Harpyia* and *Dicranura* in *Cerura*, but does not indicate the type. He sinks *bifida*, Hübn., as a synonym of *hermelina*, Goeze (Beytr. Ins. iii. (3), p. 277 (1781), and refers *bicuspis*, Steph., and *latifascia*, Curt., to *C. lanigera*, Butl., instead of to *furcula*, Linn., of which species the insect figured by Stephens and that described by Curtis are, by some entomologists, considered to be forms. *C. lanigera* is from Japan, and may be a distinct species, but possibly it is only a local form of *C. bifida* = *hermelina*.

NOTODONTIDÆ.

LOPHOPTERYX CAMELINA, Linn., *L. CUCULLA*, Esp., and *L. CARMELITA*, Esp.—The first named is the type of the genus, but Kirby changes the name to *L. capucina*, Linn.; *L. cuculla*, Esp., he also changes to *L. cucullina*, Den. and Schiff.; and *carmelita* he removes, as the type of the genus, to *Odontosia*, Hübn. Meyrick adopts the latter genus for all three species, but does not change the specific names.

NOTODONTA BICOLOR, Hübn.—Kirby places this species as *bicoloria*, Den. and Schiff., in *Microdonta*, Duponchel; but as this name is preoccupied in Coleoptera, Staudinger changes it to *Leucodonta* and Meyrick to *Hierophanta*.

NOTODONTA DICTEA, Linn., and *N. DICTEOIDES*, Esp.—Changed respectively by Kirby to *Pheosia tremula*, Clerck., and *Pheosia gnoma*, Fabr., the first named being indicated as the type of *Pheosia*, Hübn., = *Leiocampa*, Steph. Hampson also gives *dictæa*, Linn., as the type of *Pheosia*, Hübn., in which he merges *Hoplitis*, Hübn.—Type *milhauseri*, Fabr.

NOTODONTA DROMEDARIUS, Linn.—The type of *Notodonta*, Ochs., = *Peridea*, Steph. The following are also included in this genus: *N. ziczac*, Linn., *N. trilophus* (*tritophus*), Fab., Esp. (fig. 3), *N. trepida*, Esp., and *N. torva*, Hübn. Kirby sinks *tritophus* (*trilophus*) in *N. phæbe*, Scriba (Beitr. Ins. p. 18, pl. 2, figs. 1, 2 (1770); merges *trepida* in *N. anceps*, Goeze (Beytr. Ins. iii. 3, p. 207 (1781); and revives *tritophus*, Esp. (Schmett. iii. p. 299, pl. 60, figs. 1, 2, nec fig. 3 (1786), for *torva*, Hübn. (*Bomb.*, text, p. 108 (1800).

NOTODONTA CHAONIA, Hübn., and *N. TRIMACULA*, Esp.—The last named is the type of *Drymonia*, Hübn., = *Chaonia*, Steph., according to Kirby, who also includes *chaonia* in the genus, but sinks it in *D. ruficornis*, Hufn. (Berl. Mag. ii. p. 424 (1766). The species placed by Stephens in his genus *Chaonia* are *roboris*, Fabr., = *chaonia*, Hübn. (Ent. Syn. List) = *ruficornis*, Hufn. (Kirby); and *dodonea*, Wien. Verz., = *trimacula*, Esp. (E. S. L.). Meyrick includes these species, and also *dictæoides*, *dictæa* (*tremula*), and *trepida* in *Drymonia*.

PYGÆRIDÆ (NOTODONTIDÆ, Kirby and Hampson).

PYGÆRA (CLOSTERA) CURTULA, Linn., P. ANACHORETA, Fabr., and P. PIGRA, Hufn.—Kirby includes all these in *Melalopha*, Hübn. (Tent. p. 1 (1810), and indicates *curtula* as the type. Hampson places *anachoreta* in *Ichthyura*, Hübn. (Verz. p. 163 (1816), with *anastomosis*, Linn., as the type. Meyrick places all three species under *Pygæra*, Ochs. Only two species are recognised by Kirby as properly belonging to *Pygæra*, Ochs. (Schmetz. Eur. iii. p. 224 (1810); these are *P. timon*, Hübn. (type), and *P. timonides*, Brem., but neither are British insects.

ARRANGEMENT OF FAMILIES

ACCORDING TO KIRBY, HAMPSON, AND MEYRICK.

SPHINGES AND BOMBYCES.

KIRBY (Cat. Lep. Het. vol. i.).

NO. OF FAM.	NO. OF FAM.	NO. OF FAM.
7. Zygenidæ.	18. Psychidæ.	23. Drepanulidæ.
8. Arctiidæ.	19. Limacodidæ.	25. Saturniidæ.
9. Cymbidæ.	20. Notodontidæ.	26. Lasiocampidæ.
10. Lithosiidæ.	21. Sphingidæ.	28. Zeuzeridæ.
16. Liparidæ.	22. Bombycidæ.	29. Hepialidæ.

HAMPSON (Fauna, Brit. Ind. Moths).

NO. OF FAM.	NO. OF FAM.	NO. OF FAM.
1. Saturniidæ.	7. Cymatophoridæ.	15. Hepialidæ.
Endromiidæ.	(Not included by Kirby.)	17. Drepanulidæ.
(Would come here, but is not represented in India.)	8. Sesiidæ.	19. Limacodidæ.
5. Sphingidæ.	11. Zygenidæ.	20. Lasiocampidæ.
6. Notodontidæ.	12. Psychidæ.	22. Lymantriidæ.
	13. Cossidæ.	24. Arctiidæ.

MEYRICK (Hand. Brit. Lep.).

NO. OF FAM.	NO. OF FAM.	NO. OF FAM.
1. Arctiadæ.	13. Saturniadæ.	33. Zygenidæ.
4. Oneriadæ.	14. Drepanidæ.	34. Heterogeneidæ.
10. Polyplocidæ (= Cymatophoridæ).	15. Endromididæ.	38. Trypanidæ.
11. Sphingidæ.	16. Lasiocampidæ.	39. Ægeriadæ.
12. Notodontidæ.	31. Psychidæ.	45. Hepialidæ.
	32. Zeuzeridæ.	

(To be continued.)

THE NORTH AMERICAN BEES OF THE GENUS *PROSAPIS*.

BY T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

THE genus *Prosapis* (or *Prosopis*) consists of small bees with almost naked bodies, more resembling the Pemphredonidæ in appearance than their allies among the Andrenidæ. 265 species are known, the genus being of world-wide distribution. Our species never exhibit metallic colours, but some from Australia (e. g. *P. cognata*, Sm., *P. purpurata*, Sm.) show blue and purple. In certain species the base of the abdomen is ferruginous; this is the case with our own *P. nelumbonis*, Rob., and *P. flammipes*, Rob., from the Eastern U. S. (Illinois, Florida), but it is not observed in any of those found west of the Mississippi. The red base of the abdomen reappears, however, in the Sandwich Islands species, *P. hilaris*, Sm., and *P. volatilis*, Sm. The extreme development of the red is reached in the Australian *P. rubricata*, Sm., which is red with yellow markings, the scutellum, metathorax, pectus, and legs black.

Several species found in Mexico show more or less yellow on the scutellum, a character not seen in those inhabiting the United States. This fact is interesting, because in *Perdita* a Mexican species (*P. mexicanorum*, Ckll.) has a yellow post-scutellum, while all of the United States species have this part dark.

The sexes differ considerably in the markings, and the males present the best distinctive characters. The following table may be used to distinguish the known North American species in that sex:—

MALES.

- | | |
|---|---|
| 1. Supra-clypeal mark entirely absent | <i>nevadensis</i> ; also <i>schwarzii</i> . |
| 2. Supra-clypeal mark present | 3. |
| 3. Scutellum with more or less yellow; species of | |
| Mexico | 4. |
| Scutellum without any yellow | 7. |
| 4. Abdomen with two entire narrow white bands | 5. |
| Abdomen without entire white bands | 6. |
| 5. Markings white; 2nd segment of abdomen very | |
| coarsely punctured | <i>grossa</i> . |
| Markings yellow; 2nd segment of abdomen more | |
| finely punctured | <i>maculipennis</i> . |
| 6. Abdomen very minutely sculptured | <i>dubiosa</i> . |
| Abdomen with 1st segment presenting large deep | |
| punctures | <i>mexicana</i> . |
| 7. Large species with the scape heart-shaped, half | |
| light, half dark, and the tubercles wholly dark; | |
| lateral face-marks broadly triangular | <i>basalis</i> . |
| 8. Not so | 8. |

8. Lateral face-marks above receding from or not approaching orbital margin 9.
Lateral face-marks above continuous along orbital margin 22.
9. Lateral face-marks ending above in a broad oblique truncation; scape dilated, light in front 10.
Lateral face-marks ending narrowly or in a knob 11.
10. Face-marks white *antennata*.
Face-marks lemon-yellow *varifrons*.
11. Tubercles wholly dark; upward prolongation of lateral face-marks entirely separate from orbital margin, narrow and not swollen at end 12.
Tubercles partly light 13.
12. Lateral face-marks not filling space between clypeus and orbit *saniculæ*.
Lateral face-marks filling space between clypeus and orbit 12a.
- 12a. Mesothorax pubescent, wings tinged greyish *subdigitata*.
Mesothorax naked, wings tinged brownish *digitata*.
13. Upward extension of lateral face-marks wholly away from orbital margin, ending in a large knob curving over antennæ; scape light in front *bakeri*.
Upward extension of face-marks not ending in a large knob curving over antennæ 14.
14. Upward extension of face-marks wholly separated from orbital margin, even at the base 15.
Upward extension of face-marks curving away from orbital margin at the base 16.
15. Wings clear or not brownish, face yellow *rudbeckiæ*.
Wings brownish tinged, face yellowish white *ruidosensis*.
16. Tibiæ and tarsi wholly reddish orange *labiatifrons*.
Not so 17.
17. Supra-clypeal mark much longer than broad 18.
Supra-clypeal mark not or hardly longer than broad *fallax*.
18. Small species, with the upward extension of lateral face-marks diverging from orbit but itself little curved, and not greatly prolonged 19.
Larger species, with the upward extension of lateral face-marks narrow and curved 20.
19. Upward extension of lateral face-marks rapidly diverging from orbit *pygmæa*.
Upward extension of lateral face-marks slowly diverging from orbit *mesillæ*.
20. First abdominal segment smooth; end of lateral face-marks above on a smooth shining space *verticalis*.
First abdominal segment punctured 21.
21. Somewhat larger, face broader, face-marks creamy white *tridens*.
Somewhat smaller, face narrower, face-marks strongly yellow *tridentula*.
22. Supra-clypeal mark broad and short, but little longer than broad 24.

- Supra-clypeal mark broad but tapering above, like
a bishop's mitre 22 a.
- Supra-clypeal mark small and narrow 23.
- Supra-clypeal mark an elongated triangle *triangularis*.
- 22 a. Wings clear *coquillettii*.
- Wings more or less darkened 22 b.
- 22 b. Larger, scape with only a light streak, face not
much narrowed below *episcopalis*.
- Like the last, but smaller, scape all dark, face
yellow, hind tibiae wholly yellow *illinoensis*.
- Smaller than *episcopalis*, half of scape light, face
much narrowed below *georgica*.
23. Lateral face-marks very broad; face broad below *coloradensis*.
- Lateral face-marks narrow; face much narrowed
below *asinina*.
24. Lateral face-marks not tapering to upper end, but
broadly truncate 25.
- Lateral face-marks tapering to upper end, pointed
or very narrowly truncate 27.
25. Dorsal punctuation of 1st and 2nd abdominal seg-
ments very distinct; punctuation of mesothorax
relatively coarse *rugosula*.
- Dorsal punctuation of 1st and 2nd abdominal seg-
ments extremely fine or almost wanting 26.
26. Markings bright lemon-yellow; apex of supra-
clypeal mark minutely notched *ziziae*.
27. Dorsal punctuation of 1st abdominal segment in-
distinct or wanting *modesta*.
- Dorsal punctuation of 1st abdominal segment quite
distinct 28.
28. Face-markings white or cream-colour, orbits strongly
converging below 29.
- Orbits little or not converging below 28 a.
- 28 a. Face-markings buff; large species, tubercles dark,
wings fuliginous *suffusa*.
- Face-markings bright lemon-yellow *citrinifrons*.
- Very like the last, rather smaller; face-markings
orange, lateral marks differently shaped *pennsylvanica*.
29. Tegulae wholly dark *wootoni*.
- Tegulae with a light spot *divergens*.

P. affinis, Smith, and *P. modesta*, Say. — Mr. Robertson formerly published the opinion that these were identical. I found I had two species from the Eastern U. S., to which I applied these names, and accordingly wrote him about the matter. He replied that he also had arrived at the conclusion that there were two species concerned, and shortly afterwards he published the distinctive characters in *Canad. Entom. May*, 1896. His two species are the same as mine, but what he calls *affinis* I had called *modesta*, and *vice versa*. He further declares that Say's supposed male of *modesta* is really *pygmæa*, and

suggests that Smith's supposed male of *affinis* does not belong to it. The fact is, the original descriptions of both *modesta* and *affinis* are such that it is little better than guesswork to identify the species described. Mr. Robertson, feeling this, goes so far as to propose the alternative name *ziziæ* for the supposed *affinis*, and until we can have a better description of the latter, from Smith's type, it will be preferable, I think, to call the insect *ziziæ*, Rob. *P. modesta* may remain as identified by Robertson; I have found it larger than *ziziæ*, though Robertson gives the same dimensions.

GEOGRAPHICAL DISTRIBUTION.

When studying the genus *Perdita*, I was fortunate in having exact data concerning the localities and habits of most of the species. With *Prosapis*, which is distributed all over the continent, and presents few species in New Mexico, the case has been entirely different. Consequently the difficulty of correctly associating the sexes, and in many cases of determining the status of slightly-differing forms, has been very great, so that the attempt was almost abandoned. The most useful method for clearing up the difficulties alluded to is probably to consider separately the species seen from each State or territory.

ILLINOIS.—Thanks to Mr. Robertson, we are well acquainted with the species of this State, which are not numerous, viz. *ziziæ*, Rob., *modesta*, Say, *pygmæa*, Cress., *saniculæ*, Rob., *illinoensis*, Rob., and *nelumbonis*, Rob. The first three seem to be much commoner than the others. Dr. W. A. Nason sent me a large series of specimens which he had collected at Algonquin, Ill.; they include *ziziæ*, *modesta*, *pygmæa*, and a single *nelumbonis*.

IOWA.—One specimen of *P. saniculæ* has been seen. (Coll. Amer. Ent. Soc.)

SOUTH DAKOTA.—*P. ziziæ*, race *dunningi*, nov. One male, Volga, S. D., sent by Mr. S. N. Dunning. Length, $5\frac{1}{2}$ mm. Differs from *ziziæ* by the dullish and quite strongly punctured first segment of abdomen, the somewhat more dusky wings, the supra-clypeal mark long, nearly as in *illinoensis*, not notched at tip, the lateral face-marks broadened and squarely truncate at ends (not rounded or obliquely truncate), the face a trifle broader. The mandibles are strongly bifid at tips, as in *ziziæ*. From *illinoensis* it differs at once by the punctured first abdominal segment, the yellow stripe on scape, and the partly black hind tibiae. From *rugosula* it differs by the more slender and curved scape, with a yellow stripe, the lateral face-marks broader at their ends, the flagellum distinctly pallid beneath, the yellow on hind border of prothorax, and the smaller abdominal punctures.

Whether this should be considered a distinct species may only be determined when large collections of *Prosapis* are made in South Dakota and adjacent regions. It is in any event an interesting form, as it connects the Rocky Mountain types, with the first abdominal segment strongly punctured, with those of the east, in which that part is smooth or feebly punctured. The indications are that South Dakota may be a meeting-ground between the eastern and western types of bees, but unfortunately we know hardly anything of its bee-fauna.

The Coll. Amer. Ent. Soc. contains two female *Prosapis* from S. Dakota, one of them from Brookings.

PENNSYLVANIA.—A male sent by Mr. Baker differs from Illinois *modesta* in being somewhat smaller, with a narrower face, and less black on the hind tibiae. But I assume that it is the same species. The U. S. N. M. contains *P. pennsylvanica*, from Montgomery Co. Of females from Pa. I have only *modesta*, sent by Mr. Baker; they agree with those from Illinois.

Mr. Dunning sends a male *P. varifrons*, a boreal type, from Tioga Co. (A. M. Warren).

NEW JERSEY.—The U. S. N. M. contains four examples from Camden Co., May 18th, 1890; one bears Mr. Fox's name. One is a male *pygmæa*; two are male *modesta*; the fourth, also a male, may belong to *confluens*, Smith, of which only the female is known. It is nearest to *ziziæ*, but the wings are hyaline at the base, and quite strongly dusky beyond the first discoidal cell (as Smith says of *confluens*), the thoracic punctures are very large and frequently confluent, the face is broader, and more of an orange-yellow, the lateral face-marks are narrower above, taken as a whole much like a hand with the index-finger pointing upwards, the upward prolongation being neither broadly truncate nor pointed. The tegulae have a yellow spot. The label on the specimen declares it to be *modesta*, which I am sure it is not.

Mr. Dunning sends me four examples from N. J.; three of them, males, are genuine *ziziæ*; the fourth, a female, is rather larger, and has much coarser punctures on the thorax, wings clouded, except at base, and in other respects agrees with *confluens*; it has a yellow spot on the clypeus, not described by Smith in *confluens*. One of the *ziziæ* is from Ocean Grove, July 19th, 1893.

Thus we find in N. J. the three commonest Illinois species—*modesta*, *pygmæa*, and *ziziæ*, but, so far, none of the others. On the other hand, we have *confluens*, extending upwards along the Atlantic seaboard from Florida; for I feel reasonably sure that the male and female above described do really belong to that species.

NEW YORK.—Here we meet with the boreal *P. basalis*, Sm., a female, in Coll. Am. Ent. Soc., doubtless from the mountains.

CONNECTICUT.—I have before me twenty-one specimens from this State, belonging to the following species:—

(1.) *P. ziziæ*, Rob. Three males in Coll. Am. Ent. Soc. Both sexes collected at Hartford by Mr. Dunning.

(2.) *P. pygmæa*, Cress. Hartford, May 27th, &c. Mr. Dunning.

(3.) *P. varifrons*, Cress. Hartford, July 30th, 1893. Mr. Dunning. Male.

(4.) *P. modesta*, Say. Two males in Coll. Am. Ent. Soc. A male, taken by Mr. Dunning at Hartford on July 30th, 1893, has the upward prolongations of the lateral face-marks rather after the manner of the New Jersey *confluens*, but the wings are not so dark, and the thorax not nearly so coarsely punctured.

(5.) *P. verticalis*, Cress. One male in Coll. Am. Ent. Soc. Cresson gives this species as from Mass., Penn., Colo., but I suspect that his Colo. material belonged to *tridens* or *tridentula*.

MASSACHUSETTS.—There is a male *verticalis* in Coll. Am. Ent. Soc.; the antennæ are shorter than Cresson describes, but I have no doubt it is the same species. I have females of *modesta* from Mr. Baker and Mr. Dunning, the latter collected at Southampton, July 14th, 1894. One female has spots on tegulæ, and belongs perhaps to *ziziæ*.

NEW HAMPSHIRE.—There are several examples of *modesta* in Coll. Am. Ent. Soc., and one each of *ziziæ* and *basalis*. The Coll. Am. Ent. Soc. also contains several female examples of *varifrons*, one from the valleys of the White Mts.; these vary among themselves, some having, others being without, light marks on the hind border of prothorax. They differ from the Colorado form in lacking the spot on tegulæ, but this will scarcely indicate a distinct species. From *ziziæ* and *modesta*, female *varifrons* may be known by the narrower lateral face-marks, which are rather bow-shaped than triangular; from the Florida *schwarzii* it may be known at once by the much less infuscated wings, though it is in all respects very closely allied; from *elliptica* it is known by the absence of the transverse mark on clypeus,—it is probable that the specimens alluded to by Cresson as having this mark were really *elliptica*.

CANADA.—I have seen the following:—

(1.) *P. basalis*, Sm. One female. English River, Quebec. Coll. Am. Ent. Soc.

(2.) *P. elliptica*, Kirby. One female. Coll. Am. Ent. Soc. Tegulæ wholly dark. Wings brownish-hyaline, not distinctly infuscated. Anterior margin of clypeus with a conspicuous transverse light band.

(3.) *P. varifrons*, Cress. Several females in U. S. N. M. One from Toronto, the others ex. coll. Coquillett. One marked as

P. affinis by Provancher. They have dark tegulae as in the N. H. form.

(4.) *P. ziziae*, Rob. One male. Toronto. U. S. N. M. Marked *modestus*.

(5.) *P. modesta*, Say. Two males. Col. Coquillett. U. S. N. M.

MICHIGAN.—Mr. Baker sent me a male *modesta* (determined by Fox as *affinis*) from Agricultural College, Mich.

MARYLAND.—In Coll. Am. Ent. Soc. is a male *antennata*, with face-markings white, tegulae wholly dark. The type-locality of the species is New Jersey. It is very close to the male of *varifrons*, but there is less light colour on the scape, and the face-marks are not yellow. The face of *varifrons*, however, is sometimes very pale, so that I have thought it probable that the two names represented in reality but one species. If so, *antennata* will stand for all the eastern forms referred herein to it and *varifrons*, in which the tegulae lack a light spot, and will constitute a geographical race. The type-locality of *varifrons* is Colorado. There is also in Coll. Am. Ent. Soc. a female of *varifrons* with dark tegulae, or *antennata*; and a female of *modesta*.

DISTRICT OF COLUMBIA.—The U. S. N. M. contains a female *ziziae* from the City of Washington, August 22nd, 1883, through C. V. Riley.

VIRGINIA.—The National Museum contains four examples from Virginia. Two, collected June 12th, 1881, are female *modesta*; one, dated June 25th, 1882, seems to be a *ziziae*, but the head is missing; the fourth, dated June 27th, 1880, is a male *pennsylvanica*. The last species could be taken for *modesta*, did not one observe the strong punctuation of the first abdominal segment.

GEORGIA.—Here we meet with a series of species entirely different from those of the N. E. States. From males in Coll. Am. Ent. Soc. I have described three new species—*georgica*, *triangularis*, and *labiatifrons*. The same collection also contains two males of *P. divergens*, which was described from an altitude of 7000 feet in Colorado! By the face-marks this is much like *georgica*, but the first abdominal segment is strongly punctured, in the manner characteristic of western species, whereas in *georgica* it is minutely tessellate and practically impunctate. I cannot help suspecting that the locality-label on these two *divergens* is erroneous, though it is by no means impossible that it may be correct.

A number of female *Prosapis* from Georgia, in Coll. Am. Ent. Soc., have given me some trouble. Three I referred to *floridana*, Rob.; but a renewed examination, and comparison with one of the types of *floridana*, kindly lent by Mr. Robertson, indicate that this is probably an error. One of the three is distinct from the other

two by its broad face, shorter lateral face-marks, and more dusky wings. The two others are very near to *floridana* indeed, especially in the form of the face-marks, but that has a perceptibly narrower face, and seems to be different. It may be that they represent the female of *georgica*. The lateral face-marks in these forms are very elongated triangles, more or less truncate at the upper end; thus they are longer and not so broad as in *zizæ* and *modesta* females, but at the same time they are more distinctly triangular than is usual in *varifrons*. Another Georgia female, which I had put aside as distinct, seems to be really *floridana*.

Another series of Georgia females represents a larger species, with perceptibly darkened wings, and chrome-yellow face-marks shaped as in *modesta*. This, I take it, is the female of *triangularis*. It will not be confounded with *schwarzii*, as that has the lateral face-marks so much narrower and paler, and the wings still darker. It might more easily be taken for *confluens*, but the punctuation of the mesothorax is by no means so coarse, nor confluent, and the sculpturing of the front is very much finer, not running into grooves as in *confluens*.

It is pertinent to remark, that the male *triangularis* is very much like the N. J. male supposed to be *confluens*, but the supra-clypeal mark is longer, and its lower margin is almost straight, whereas in the N. J. insect it is noticeably curved. The ocelli are smaller and somewhat closer together in the N. J. insect. The N. J. male is not like the female *confluens* in the sculpturing of the front.

The student will, I am afraid, feel much dissatisfied with the uncertainty of the conclusions reached above; but he is reminded that the study of miscellaneous specimens without any biological data can never lead to the best results; and it is the writer's purpose rather to insist upon the need for further investigation, than to suggest that the present results are in any sense final.

(To be continued.)

A NEW SPECIES OF *CHARAXES* FROM SIAM.

By PERCY I. LATHY.

Charaxes nigrobasalis, sp. nov.

♂. Fore wings similar to *C. rothschildi*, Leech, but paler. The basal black does not extend so far along inner margin as in that species, and the black marginal border is much narrower at the anal angle. Hind wings as in *C. eudamippus*, Doubl., but row of light marginal spots paler. Thorax blackish, abdomen pale yellow. Under side as in *C. eudamippus*, Doubl., but with submarginal orange markings and orange spot at anal angle much more dull and indistinct.

Hab. Pak-a-jong, Siam. In coll. H. J. Adams.

Two males of this interesting species have just been received by Mr. Adams from Mr. W. Watkins, of Eastbourne.

It may easily be distinguished from *C. rothschildi*, Leech, by the narrow band of the hind wings, and pale yellow abdomen; and from *C. eudamippus*, Doubld., by the black base of the fore wings, and by the whole of the discoidal cell being filled in with black.

Lynton Villa, Sydney Road, Enfield.

AMONG THE BUTTERFLIES AND FLOWERS OF NORWAY.

By R. S. STANDEN, F.L.S., F.E.S.

THERE is a charm attaching to Entomology which few other sciences possess; it impels its votaries to foreign climes. Bates's "half-starved fragment" is no longer the fetich of a crowd, but is recognized for the tail-end only of a vast geological area that it really is. The glittering halos of the British-caught *Antipas* and *Lathonias* of our youth have a sadly tarnished lustre now, and, when we meet these lovely creatures in their hosts on the Continent we sigh for the pleasing illusions of the past, but rejoice in our emancipation. And so, after having explored at different periods most of the central and southern countries of Europe, a friend and I found ourselves, on the last Sunday in June, in the bright little capital of Norway.

We were both of us more or less familiar with the phenomena of the midnight sun, but it was something of a surprise to find that, as far south as Christiania, it was still possible at 12 p.m. to read a book at the open window without artificial light. It was still more strange perhaps to see people promenading the streets and public gardens, and sitting about on benches, long after midnight, in costumes of the most light and airy description. It is difficult to realize that we are in the 60th degree of North latitude, with a sky as pure and an atmosphere as dry and warm as that of Florence.

Such an introduction to the northern capital augured well for our brief visit to the country, and with few exceptions the promise of fine weather was well maintained.

We proposed to make careful notes of all the Lepidoptera—more especially *Rhopalocera*—that came under our observation; also of all the *Phanerogamia*, and, in my friend's case, of mosses, of which he collected, as it seemed to me, about half a cart-load, and will doubtless give a good account of them elsewhere. But in our secret hearts we pined after *Argynnis freija*, *Erebia embla*, and *Encis jutta*—quite satisfied of course to have a good look at

them and establish their identity; but, as my companion archly observed, when taxed with the discrepancy between his principles and his active conduct with the net, there was no harm in securing a few for the benefit of one's friends! And certainly, taking the amount of downright hard labour into account, the doctrine of altruism was never better illustrated.

The locality indicated to us by "Statsentomolog" Schøyen was Disenaaen on the Kongsvinger line of rail, about forty miles N.E. by E. of Christiania, and we were fortunate in meeting with most excellent accommodation at Saeterstöen, three miles away, but in the neighbourhood of which also both *embla* and *jutta* were fairly abundant.

For *freija* we were unhappily too late, although a friend who preceded us by a week obtained, I believe, the one specimen necessary to establish its existence. Although *embla* and *jutta* were considerably to the fore, both here and at Disenaaen, perfect examples were in the proportion of one to three at the outside. Both of them—more especially *jutta*—have a habit of sitting sideways, with closed wings, on the trunks of small firs, with the ragged bits of whose bark they are easily confounded. I must confess I took full advantage of this peculiarity, to the great saving of both wind and legs.

They have an exasperating zigzag method of flight, and after you have pursued one some way he will often suddenly disappear in mid air as if by magic; then you know what has happened, and by a cautious stalk from behind you may generally sweep him off the tree on which he has settled.

A. aphirape was also common enough locally, but, until we got accustomed to its hesitating mode and slightly duskier appearance, it was easy to mistake it for *A. euphrosyne*.

In selecting a habitat for these three creatures it is certain that the Creator took no account of the requirements of their puny captor, man. It may be worse in the tropics—it no doubt is—but, for Europe, of all the damp, treacherous, unpleasant soils the entomologist has to negotiate this would be hard to beat. A bog of yielding mosses and juicy peat, in which you flounder a foot deep at every step, and are lucky when the water does not come above the ankle—felled pine trunks and jagged branches lying prostrate in every direction, and tripping you up in the chase more frequently than you care to be reminded of—lovely grey patches of reindeer-moss, looking, at a little distance, beneath the flickering shade of scraggy firs, for all the world like a cool grey rock inviting a rest, and which if, in an unwary and exhausted moment you yield to the temptation, only lands the nether portion of your person in a bath of slush. Added to this, the thin stems of the ubiquitous fir and birch seem expressly invented to baffle the netsman and help the wary prey. So the task of collecting for friends is not all "cakes and ale."

But, *en revanche*, in cloudy intervals—not always the worst for these species by the way—or when exhausted nature clamours for repose, what gems of plant-life greet the eye! *Linnæa borealis*, with its delicate little nodding white bell lined with rose-pink, two on each slender peduncle, is everywhere present, tenderly reminiscent of the great Swede whose favourite it was. The white star of *Trientalis europæa* rises modestly from the bed of *Sphagnum* that holds its tender rootlets in loving embrace; and the three *Vacciniums*—*occycoccus*, *Vitis idæa* and *uliginosum*—are almost universally abundant; as is also, in the more open parts of the bog, *Rubus chamæmorus*, the cloudberry.

Our road to the Disenaaen bog lay along the railway—three miles of it—and a fine of two *krone* for trespass; but the officials were most polite, and the rule appeared to be relaxed in our favour. On each side of the single line of rails were broad, sloping banks, densely diapered with many kinds of greenery. Here were *Equisetum sylvaticum*, and two others, in great abundance—the smallest of them looking, at a little distance, like a long-piled carpet on the uppermost edge of the bank, and creeping even under the rails and in between the sleepers. Here also were *Pyrola media*, *minor* and *uniflora*—*Moneses grandiflora* of the 'London Catalogue.' When now, for the first time, I saw this lovely thing alive the barren poverty of my "Hortus Siccus" struck home to me like a blight. "Good-bye to the Herbarium!" I said; but things look different when you get home, and that long row of portfolios so neatly labelled is still unburnt. Another delicate little plant, *Smilacina bifolia* (*Maianthemum convallaria*), the May lily, found only in one spot near Scarborough with us, was common enough in places, and quite abundant on the roadsides near Christiania. Large white patches of *Galium boreale* occurred here and there, and the beautiful white arum-like heads of *Calla palustris* lit up the dark quagmires of the bog that skirted the rail with an almost uncanny lustre. But dazzling beyond everything else were broad clusters of the rich crimson-purple *Lychnis viscaria*. They were our landmarks along the line. At this one you entered the bog for *E. embla*, just beyond that one was a spring of the purest and coldest water, and when the eye once rested upon one of these patches all else was merged in grey. A dangerous competitor would be *Epilobium angustifolium*, if they were both out together—not so aggressive to the eye, but more graceful, and more tender in its rose-bay tints, and it made a broad fringe all along the line.

The butterflies that occurred most commonly on these banks were *P. machaon*, *A. cratægi*, *P. brassicæ*, *E. cardamines*, *L. sinapis*, *C. palæno*, *T. rubi*, *P. hypothoë*, *L. ægon*, *semiargus* and *cyllarus*, an occasional battered *V. antiopa*, *M. athalia*, *A. selene* and *euphrosyne* (both extremely common), *P. hiera*, *C. pamphilus* and

typhon, *S. malvæ*, *N. tages*, *H. sylvanus*. Wild strawberries were in countless thousands, and delightfully cool and refreshing in the hot sun, whilst a long range of blue hills along the horizon was equally so to the eye.

Before taking leave of this first portion of our trip, I feel that, for the sake of any who may be disposed to follow in our steps, I cannot do less than highly commend the house of our cultivated hosts, Herr. and Fru Wattne, of Maarud, Saeterstøen, per Christiania. He has a large farm, and the comfort and attention we experienced at their hands were beyond anything I can recall on similar occasions elsewhere.

(To be continued.)

NOTES AND OBSERVATIONS.

LARVÆ OF PYGÆRA (CLOSTERA) RECLUSA EATING LARVÆ OF DICRANURA VINULA.—I have been rearing a brood of some thirty-five larvæ of *C. reclusa*, and when they were about half grown I put in with them fourteen larvæ of *D. vinula* freshly emerged from the ova. However, after a day or two, observing that the numbers of the latter grew "small by degrees and beautifully less," I kept them under close supervision, with the result that I caught a fine *reclusa* "red-handed," and thus accounted for the mysterious disappearance of the young *vinula*! Is it not rather unusual for this species to display such voracity? I can assign no reason whatever for their conduct, as they were abundantly supplied with young poplar leaves kept always fresh by having the stalks in water, and it therefore cannot have been for want of food. I reared a large number of *C. curtula* last season; and, although they were kept together with some young *vinula*, they showed no such cannibalistic propensities.—H. W. SHEPHEARD-WALWYN; West Downs, Winchester.

BUTALIS CICADELLA, Z., not in LANCASHIRE.—In the 'Entomologist,' xxvii. 246 (1894), the late Mr. J. B. Hodgkinson records the occurrence of *Butalis cicadella* in Lancashire, stating that he took a very fine example of it near Fleetwood on June 15th, 1894, and was able to identify it by comparison with a specimen in his cabinet, which had been captured at Southend by Mr. S. Stevens about forty years before. When Mr. Hodgkinson's collection was on view at Stevens's rooms in December last, I examined the series of *B. cicadella*, left exactly as he had arranged it, and found that it consisted of three specimens. The first, beneath which was Hodgkinson's MS. label—"Lane near Wyre, June 15th, 1894"—was obviously the moth referred to in his published note (*loc. cit.*), "Fleetwood" and "Wyre" being used synonymously; but instead of being *B. cicadella* it was in reality a dark unicolorous example of *Bucculatrix maritima*, Stn., bearing not the faintest resemblance to any *Butalis*! The second was a *Butalis* so hopelessly rubbed and discoloured that certain recognition was impossible, though it clearly never was *cicadella*; while the third was the example of the

true *B. cicadella*, Z., that had been received from Mr. S. Stevens. The lot containing them fell to me, so I have been able to examine them again at leisure. In his note (*loc. cit.*) Hodgkinson says that *B. cicadella* had previously only been taken by Messrs. Dunning and S. Stevens; but as a matter of fact it had also been captured by Messrs. R. McLachlan (E. M. M. viii. 92) and W. Farren (Entom. xxi. 62). I have used the name *Butalis* above because Hodgkinson did so in his note; but the genus should be known as *Galanthia*, Hb.—EUSTACE R. BANKES; The Rectory, Corfe Castle, June 24th, 1898.

LOCALITIES FOR DRAGONFLIES WANTED.—Mr. Lucas, of 278, King's Road, Kingston-on-Thames, would be glad to receive well-authenticated localities of the British dragonflies, for work on the group that he is preparing.

CAPTURES AND FIELD REPORTS.

ARGYNNIS LATONA IN SOMERSETSHIRE.—On July 20th I captured a nice specimen of *Argynnis latona* near a clover field at a place about four miles from Clifton. It measures 4·5 centimetres across the wings. The Rev. Joseph Greene has seen the insect, and says that it is undoubtedly *A. latona*. — RALPH RYLANDS; School House, Clifton College, Clifton, Bristol.

PLUSIA MONETA IN KENT.—It may be interesting to record that a working man has found in his garden, situated in the heart of the east end of this town, ten cocoons of *Plusia moneta*, from four of which imagines have emerged. They were found on the under side of the leaves of monkshood. Evidently this beautiful moth has come to stay, as I have taken eight at light during the last few years. — R. A. DALLAS BEECHING; 24, St. James Road, Tunbridge Wells.

PLUSIA MONETA IN SURREY.—I understand that a cocoon of this species has been found at Surbiton just recently.—R. SOUTH; July 23rd.

AGROTIS ASHWORTHII IN NORTH WALES.—I have just bred a lovely series of *Agrotis ashworthii* from larvæ taken at Penmænmaur the last week in April. The form is distinctly darker than the Llangollen form of the species, and the markings scarcely so clearly defined. The rock cistus does not grow at Penmænmaur, and I found my larvæ mostly on sheep's sorrel (*Rumex acetosella*), growing on the barest parts of the mountain.—GEO. T. PORRITT; Crosland Hall, Huddersfield, July 4th, 1898.

EUPITHECIA VENOSATA AT BALHAM.—On July 2nd last I saw a nice fresh specimen of this species at rest on a fence near the station. The food-plant (*Silene inflata*) occurs sparingly on the side of the railway just opposite the spot where the insect was noticed.—RICHARD SOUTH; 100, Ritherdon Road, Upper Tooting, S.W.

DICRANURA VINULA AT CHESTER AND RIGA.—This moth was unusually common at Chester in the first week of June. It appears to have been equally observed at Riga (Russia), and at the same time. A fine male taken at the last-mentioned locality, which I have just set, is smaller, paler, and much less marked than our English specimens.—J. ARKLE; Chester.

LITHOSIA MESOMELLA IN DELAMERE FOREST.—During an afternoon ramble in Delamere Forest (June 29th) by members of the Chester Natural Science Society, three specimens of *L. mesomella* were taken at rest. As far as I know, the earliest record of the insect for the district is one of my own (see Entom. xxvii. 247). We found other good moths fairly common during the ramble, such as *Eucosmia undulata*, *Macaria liturata*, and *Drepana falcataria* (*falcula*).—J. ARKLE; Chester.

LAMPYRIS NOCTILUCA NEAR CHESTER.—Whilst sugaring at Sealand, with the Messrs. Thompson, of Chester, on the night of June 24th, we came across two of these beetles—the well-known “glowworms.” The species has been taken previously, but rarely, I believe, near Chester; at any rate, this is the first occasion I have met with it in the district. The Messrs. Thompson tell me they have come upon as many as five in an evening in the Sealand neighbourhood. I well remember the wonder and admiration I felt upon seeing “glowworms” for the first time, some years ago, in the Tan-y-Bwlch valley, North Wales (Entom. xxvi. 289).—J. ARKLE; Chester.

NEW FOREST, 1898.—Nine days' collecting at Lyndhurst with Mr. A. G. Saunders, from June 3rd to June 12th, produced very favourable results, considering the lateness of the season. The weather turned out very fine, but it was very cold at night. At Stubby Copse *Nemeobius lucina* was very abundant, but rather worn; *Argynnis selene* and *A. euphrosyne* were, however, in splendid condition. *Syrichthus alveolus* was abundant, and I managed to get two nice varieties. On June 5th we visited the Rhinefields, and found the rhododendrons very backward; but the azaleas were in full bloom, and we took seven *Macroglossa fuciformis*; on June 11th I again went there, and took fifteen *fuciformis* in very fine condition, but no *M. bombylififormis*, although the latter were common on the railway bank near Brockenhurst. During the day we took *Boarmia consortaria*, *Ephyra omicronaria*, *Venilia maculata*, *Lithosia aureola*, *Moma orion* (one at rest on a beech trunk), *Phytometra anea*, *Coremia propugnata*, *Euclidia jacobæ*, *Euclidia mi*, *E. glyphica*, *Panagra petrararia*, *Ligdia adusta*, *Corycia taminata*, *Melanthia ocellata*, *Bombyx rubi* (including three females), *Scodionia belgiaria* (abundant), *Fidonia atomaria*, *Aspilates strigillararia*, *Nemoria viridata* (common), and *Spilosoma mendica*. Sugaring proved very unsuccessful; only nine *Thyatira batis*, three *Miana strigilis*, three *Grammesia trilinea*, one *Acronycta psi*, one *Noctua plecta*, and one *Aplectes herbida* came to the bait. Beating for larvæ was very unproductive, except for a small larva of *Apatura iris*, which fell from a sallow into the beating-tray; while the oaks at Hurst Hill only resulted in one very small larva of *Catocala sponsa*, and not a single *C. promissa*. On the heath there were plenty of larvæ of *Bombyx trifolii*, *Agrotis agathina*, *Noctua neglecta*, and *Selidosema plumaria*; and by searching the honeysuckle we only obtained two full-grown larvæ of *Limenitis sibylla*, while from lichens a few larvæ of *Cleora glabraria* and *C. lichenaria* were collected. The other larvæ were *Tephrosia biundularia*, *Bombyx neustria*, *Argynnis paphia*, *Tæniocampa munda*, and *Amphipyra pyramidea*.—H. O. WELLS; Hurstfield, The Avenue, Gipsy Hill, London, S.E., July 5th, 1898.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*June 23rd, 1898.*—Mr. J. W. Tutt, F.E.S., President, in the chair. Mr. Broome, Christchurch, Oxford, was elected a member. Mr. Filer exhibited living larvæ of *Thecla rubi* feeding on rock-rose (*Cistus*), and called attention to their remarkable protective coloration. Mr. Adkin, larvæ of *Acidalia marginipunctata* (*promutata*), and read notes on their habits. Some were nearly full-fed, while others were small. The ova had hatched in the early autumn. Mr. Moore, two fine varieties of *Arctia caia* bred from ova by Mr. Cooke: 1, fore wings uniformly dark chocolate without the usual cream markings; 2, fore wings with a very considerable decrease in the area covered by the dark markings. The larvæ, some sixty in number, fed all the winter on cabbage. Mr. West, the Coleoptera he had taken at the Reigate field-meeting. Mr. Barnett, a specimen of *Venilia maculata* having the dark blotches irregularly joined and blurred on one side only.

July 14th.—Mr. R. Adkin, F.E.S., Vice-President, in the chair. Mr. H. Shortridge Clarke, F.E.S., Sulby Vicarage, Isle of Man, was elected a member. Mr. South exhibited a series of *Lycæna corydon*, to illustrate the variation in the number and arrangement of the spots on the under surface; also a series of forty-two *Spilosoma lubricipeda*, comprising thirty-five var. *satima* = *radiata* in both sexes, and seven typical males, all reared from ova laid by a dark female *satima*. Mr. Moore, a dwarf specimen of *Polyommatus icarus* from Folkestone. Mr. Lucas, specimens of *Libellula quadrimaculata* showing considerable variation in the size of the dark spot, and also in the amount of the saffron coloration. Mr. West (Greenwich), a short series of the local hemipteron, *Lopus flavomarginatus*, from Abbey Wood. Mr. Dennis, the egg of *Polyommatus icarus* under the microscope. It was comparable to a beautiful white double dahlia. Mr. Adkin read a report of the field-meeting held at Reigate on June 11th.—HY. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*June 20th, 1898.*—Mr. R. C. Bradley in the chair. Mr. H. Willoughby Ellis, Park Grove, Solihull, was elected a member. Mr. C. J. Wainwright showed a short series of *Orthoneura elegans* (four males, four females) and *O. brevicornis* (nine males) from Sutton, taken on May 15th and 22nd this year, and said that both species were exceedingly rare, and that they had previously been known as British only from a few odd specimens. Mr. Bradley showed *Anthophora pilipes* and *Andrena gwynana*, both of which species had been very common at Droitwich in the first week of April this year. Mr. Martineau said that *A. pilipes* occurred at Solihull, and was doing much damage to the church wall by burrowing in the red sandstone of which it consists. Mr. Fountain showed a collection of insects made in Herefordshire on Whit Monday, including *Epione advenaria*, *Ligdia adustata*, *Minoa euphorbiata*, *Ephyra omicronaria*, *Hadena genistæ*, *Cucullia verbasci*, &c. Mr. Martineau showed *Andrena cingulata*, male and female, from Bewdley, where they were taken on May 9th; he said they were the first local specimens he had heard of.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

KENDAL ENTOMOLOGICAL SOCIETY.—On July 11th the second meeting of this Society was held in the Blue Coat School, and was very well attended, twenty-five members being present. Three new members were elected. Dr. Parker laid before the Society his scheme whereby the Entomological Society, while retaining its independence, should be recognized by the Town Council as one branch of a larger body in the shape of a Natural History Society generally. He further stated that the Town Council had handed over a room in Abbot Hall for the exclusive use of the Natural History Society, and that the Education Committee were generously prepared to provide funds for its maintenance, such as lighting, heating, cleaning, and any necessary printing, &c. He believed also that they would provide a cabinet in which a model collection of the lepidopterous fauna of the district might be made. Mr. Moss, in reply, thanked Dr. Parker for his suggestions, and for the trouble he had taken on behalf of the Society, and suggested that they should accept the offer, thus made, with gratitude. He stated that by so doing the Society could lose nothing, but would probably gain considerably by being recognized by the town, by having efficient headquarters, and by associating with other branches of natural science. Practically the only change would be that the Society would hold its meetings in Abbot Hall instead of in the Blue Coat School. The motion was put to the meeting and unanimously accepted. The Rev. A. M. Moss then gave an elementary lecture on the forming of a collection of Macro-Lepidoptera, urging the members to have some definite end and aim in collecting, and not to collect merely for the sake of amassing numbers of specimens, or for any love and unsportsmanlike motive, which was contrary to the true spirit of an entomologist. He emphasized the value of thoroughness in every department of the work, if success was to be attained. Mr. Holmes exhibited a case of Lepidoptera captured since the previous meeting, embracing amongst other good forms a fine variety of *Abraças grossulariata*, in which the costa and outer margin of the fore wings were almost entirely black. He also exhibited a nice series of newly captured and unset *Erebia epiphron*, from Red Skrees. Mr. Inder, Mr. Littlewood, a case of nicely-set insects, some recently caught, some from the previous year, and showing pupæ-cases in several instances, a point which it was hoped would be more universally adopted. Mr. Moss, a drawer of hawk-moths and clear-wings, and a box of recent captures and bred specimens, including a series of *Nemeobius lucina*, *Proclossiana statice*, *P. geryon*, and *Zygana filipendulæ*, caught on a railway bank, one with only five spots, and two others with the middle pair of spots much reduced in size; also a specimen of *Macroglossa bombyliiformis*, from the same place. Mr. Smith reported having just taken a var. *hospita* of *Chelonia plantaginis* on Red Skrees. Mr. Whitehead exhibited two *E. epiphron*, *C. plantaginis*, *Scodiona belgiaria*, and others, taken in the Langdale district. Mr. Wright exhibited a specimen of *Bombyx rubi*, *Acronycta rumicis*, and a specimen of *Plusia interrogator*, bred from a pupa found spun up on heather near Staveley.

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DICHRORAMPHA FLAVIDORSANA, KNAGGS.

By H. GUARD KNAGGS, M.D., F.L.S., &c.



D. flavidorsana, reproduced from Robinson's figure (*E. A.* for 1867).

SOME time ago my attention was drawn by Mr. South to an article in the 'Annals of the Entomological Society of Belgium' (February, 1898, pp. 34-38), by Baron de Crombrugghe de Picquendaele, on certain Lepidoptera new to the Belgian fauna, wherein was a note referring to the distinctness of the above insect from *D. petiverella*, the difference of its habits from that species, and its attachment to its food—the tansy.

After reading this I took the liberty of writing to the Baron, who most obligingly supplied me with half a dozen specimens of the insect in question, and informed me that they had been named "*D. flavidorsana*, Knaggs," by Drs. Staudinger and Bang-Haas; but that Lord Walsingham had subsequently pointed out to him that they were *questionana*, Zeller = *alpinana* of Stainton's 'Manual.'

From my recollection of the original specimen, from which my description (*E. M. M.* iii. pp. 176-7) and Robinson's figure (*Ent. Annual* for 1867, plate, fig. No. 5) were taken, I felt satisfied that *flavidorsana* could not be *petiverella*, and therefore referred to my above-mentioned description, where I found:—

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1st. That Mr. Doubleday (in 1864 or 1865) was "confident that was merely a variety of *alpinana*."*

2nd. That about that time (1864-5) I returned the insect to Mr. Barrett as "*alpinana*?"*

3rd. That in describing the original male (in 1867) I stated that it partook of the characters of *alpinana*,* excepting that the ground colour was darker, the bright tawny markings at the apex and hind margin were more evident, and the yellow lunule was more conspicuous and more vivid. I note, too, that it was on these very characters that Prof. Zeller, in his "*Albula Fauna*" (Stettin. Ent. Zeitung, 1878), laid stress in differentiating his *questionana* from the ordinary *alpinana** of the period.

Under these circumstances I sought the assistance of my good friend Mr. C. G. Barrett, asking if he could let me have a sight of the original specimen if still in existence, a request with which he not only most kindly complied, but went to the further trouble of procuring for me, from Dr. Mason, the loan of Mr. Meek's North Devonshire insect, which was considered by Mr. Doubleday and myself, in 1867, to be a variety of *flavidorsana*, notwithstanding that it differed from the latter, inasmuch as the dorsal blotch bore a resemblance to that of *petiverella*, as stated at the time (E. M. M. iii. p. 177).

I am now, on re-examination of these specimens, compelled to modify the views I held in 1867, and in doing so shall confine my remarks to the males; the specimens sent to me as the females, which I simply described as "excessively like *petiverella*," certainly belonging to that species; and indeed my friend Mr. Barrett, in answer to a query of mine, says that he had no proof at all that they were the females of *flavidorsana*.

As for the males—which I think I have never, till now, seen side by side—Mr. Meek's specimen appears to be *petiverella*, with a curiously-formed dorsal blotch, looking as if two twin blotches had become united into one, with a small dark spot at the broadened base close to the dorsal margin. Mr. Barrett's original type, on the other hand, seems to me to be identical with *questionana*, Z., = *alpinana* of the 'Manual,' the difference in character of its darker ground colour, the brighter tawny markings at apex and hind margin, and the conspicuous bright yellow dorsal patch being insufficient to separate it as a distinct species; for I find that the insect, from these parts at any rate, is more variable in these respects than I had formerly imagined it to be.

However, with Mr. Barrett's and Dr. Mason's permission, I purpose exhibiting these interesting specimens, together with examples of Folkestone *flavidorsana* (kindly lent by my friend Mr. Purdey), at an early meeting of the London Entomological

* The *alpinana* here referred to means the *alpinana* of Stainton's 'Manual.'

Society, in order that the Fellows may have an opportunity of judging whether *flavidorsana* is really *petiverella* or *questionana*.

Folkestone: August, 1898.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC RHYNCHOTA).

By G. W. KIRKALDY.

(Continued from p. 180.)

MOUNTING.

Until a few years ago the almost universal method of mounting bugs and beetles consisted in gumming or glueing the ventral surface of the insect on to a square or oblong piece of card, sometimes with the legs carefully extended, but more often cramped together under the body. Now, considering that very important specific characters are furnished by the legs and ventral surface of waterbugs, this method is evidently inconvenient, and I am of the opinion that it is best to *pin* whenever possible.

Notonecta, *Nepidæ*, *Naucoridæ*, and the three larger species of *Gerris*, should be transfixed through the scutellum by a fairly stout "entomological" pin, about 35 millimeters (*i.e.* one inch and three-eighths) long; for example, D. F. Tayler & Co.'s No. 16.

The specimens should be transfixed up to within about half an inch from the head of the pin, and I think that a strong pin is a great advantage, on account of retaining its position firmly and steadily in the cork, and not suddenly bending at various points, as is the custom of the very fine pins used by many continental rhynchotists. After the lapse of years the general condition of the insects mounted in the former manner will be found to be much better than those mounted in the latter way.

British collectors have long been notorious on account of their predilection for short pins; the advantages, on the other hand, in favour of those I have previously mentioned are very great; for instance, the danger of attack from *Anthrenus*, *Atropos*, &c., is minimised almost to the vanishing point (although of course the usual precautions must be adopted), and the space for necessary labels is much increased.

I cannot recommend black pins,—they are too soft and pliant. Headless pins have often been advocated, but I think that a small head is a great improvement.

For *Velia*, *Æpophilius*, *Acanthia*, and the smaller species of *Gerris*, the smallest and finest pin obtainable (about 14 milli-

meters, say half an inch long) should be employed. This is thrust through the scutellum, as in the larger species, and then through a small piece of pith.* Through the other end of the pith is stuck a No. 16 pin. The labels will, of course, be affixed to the larger pin. The male and female (especially when caught *in cop.*) can be pinned on the same piece of pith.

It is not advisable to pin *Corixa* at all, as there is no visible scutellum, and as a very valuable specific character, the *strigil*, occurs on the dorsal surface of the sixth abdominal segment of the male, the ornamental sex cannot be pinned through the elytra. These insects should, therefore, be affixed with gum or glue to the apex of a small isosceles triangle of cardboard of medium thickness, through the base of which is run a No. 16 pin. If possible, the tip of the card should cover only the metasternum or first abdominal segment on one side; by this method practically the whole insect is available for examination, and, if preferred, it may be adopted in the case of those specimens for which I have advocated the pith staging. *Plea*, *Micronecta*, and the smaller *Gerridæ* may be mounted on small oblongs of card, affixed by the ventral surface. Before mounting, the legs (and, in the *Gerridæ*, the antennæ) should be thoroughly cleaned and carefully spread out; one or two examples of each species should be mounted venter upwards, and one or two on their sides. I must admit that I have not yet found a really convenient fixative; a good liquid glue is perhaps the best,—the formerly much advocated gum tragacanth is an abomination, and should not be used under any circumstances.

Specimens should be mounted as soon as possible after capture.

Of course these methods take a much longer time than the older methods of glueing everything down on to card, but the first consideration should be, "What is the *best* and most *convenient* mode of preparation to facilitate future study?" Moreover, the heterogeneous appearance occasioned by the different ways of setting, some on single pins, others staged, others on triangular cards, and yet others on oblong cards, will undoubtedly be displeasing to those gentlemen to whom it is of prime importance that every specimen should be at precisely the same distance from the point of the pin, and that the legs in every specimen should be extended at precisely the same angle; but I hope that any of my readers who may be induced to take up the collection of British Aquatic Rhynchota will do so with the ulterior motive of *study*.

A few examples of each species should be preserved in alcohol or formalin, both imagines and "preparatory" stages. The latter will be discussed separately later.

There should be attached to every specimen at least two

* Messrs. Watkins & Doncaster sell "Polyporus" pith for this purpose.

labels, one with the locality, the other with the name of the insect; and when specimens have been received from correspondents, it is well to add a third bearing the name of the sender. In my own collection, when I have been able to examine the original type specimen of any species, and to compare with it my own or other examples, I add a fourth label, "Compared with the Type in colln. by G. W. Kirkaldy." This is more useful perhaps in rare and little known exotic species.

Note-books are necessary for the registration of species, both those obtained from other workers and those collected by oneself, with notes on habits, locality, &c.

It will not be necessary to speak here of cabinets, store-boxes, mite and mould preventives, as the treatment in this case will not differ materially from that adopted for other insects.

In concluding the hints on "*Mounting*," I would reiterate "use long pins," "mount as soon as possible after capture," and "label fully."

One word as to measuring. It is the almost universal practice among entomologists to employ the metrical system, and it will be well for young collectors to familiarize themselves with it.

LITERATURE.

The following are a few of the books and papers that should prove useful to the British collector:—

1. Saunders—'Hemiptera-Heteroptera of the British Isles.' (Reeves, 1892. 14s.). In this indispensable work, analytical tables and short descriptions are given of all the species known up to 1892. As the author does not adopt the almost universally accepted "law of priority" in nomenclature, a short list of necessary alterations will be given subsequently.

2. Douglas and Scott—'British Hemiptera-Heteroptera' (Ray Society, 1865. Obtainable from secondhand booksellers for about 18s.). This work is out of date; and, moreover, possesses the disadvantage of being unprovided with analytical tables; nevertheless, it is well worthy, from the excellence of the illustrations, of being added to the student's shelves.

3. Dufour—'Recherches anatomiques . . . sur les Hemiptères' (Mém. Savants Etrang. à l'Acad. Sci. iv. pp. 129–462; 1833. Obtainable from secondhand booksellers for about 16s.). These researches deal with the anatomy and biology of a number of species occurring in the British Isles.

4. Miall—'Natural History of Aquatic Insects.' (Macmillan, 1895. 6s.) Sixteen pages deal with waterbugs.

The student will also, after mastering these works, find it well to become acquainted with the papers dealing with the waterbugs of the various European countries by Fieber, Stål, J. Sahlberg, Puton, Horváth, &c.

5. Riley—"Directions for Collecting and Preserving Insects" ('Bulletin of the United States National Museum,' No. 39, Part F, 1892). This profusely illustrated work of nearly one hundred and fifty pages can be obtained on application to the Secretary of the Smithsonian Institute, Washington, D.C. I believe that applications from *bona fide* workers are not refused.

6. A label list, based on Mr. Saunders's work, is obtainable from Mr. T. M. McGregor, of Perth.

(To be continued.)

A CATALOGUE OF THE LEPIDOPTERA OF IRELAND.

By W. F. DE VISMES KANE, M.A., M.R.I.A., F.E.S.

(Continued from p. 107.)

PYRALIDES.

AGLOSSA PINGUALIS, L.—Universally distributed.

[*PYRALIS GLAUCINALIS*, L.—Recorded by Sinclair from "Wicklow," on what authority I know not. No specimen in his collection. I think it as well to await a better authenticated capture.]

PYRALIS FARINALIS, L.—Common.

SCOPARIA AMBIGUALIS, Tr.—Widely distributed. Powerscourt, Co. Wicklow, common (B.); Belfast (W); Armagh (J); Monaghan and Tyrone; Farnham, Cavan; Donegal; Markree Castle, Sligo; Clonbrock, Co. Galway; Crookhaven, Glengarriff, and Killarney, Co. Kerry; Dromoland Castle, Co. Clare, &c.

SCOPARIA CEMBRE, Haw.—Howth (B.), Co. Dublin; Magilligan, Co. Derry; Valentines Glen, Belfast (W).

SCOPARIA DUBITALIS, Hb.—Not rare. Killarney, abundant; Killynon, Co. Westmeath; Howth; and near Belfast (W).

SCOPARIA MURANA, Curt.—"Belfast, Mr. Hogan" (B).

SCOPARIA LINEOLA, Curt.—"Galway, August" (B.); Howth (Shield), and Skerries, Co. Dublin; Magilligan, Co. Derry (Curzon).

SCOPARIA MERCURELLA, L.—Pretty common.

SCOPARIA CRATEGELLA, Hb.—Howth; Dromana and Cappagh, Co. Waterford; Ardtully near Kenmare, Co. Kerry; Clonbrock, Co. Galway.

SCOPARIA RESINEA, Haw.—Powerscourt, Co. Wicklow (B.); Loo Bridge, near Kenmare, Co. Kerry.

SCOPARIA TRUNCICOLELLA, Sta.—Sneem, Ardtully near Ken-

mare, and Killarney, Co. Kerry; Dromana, Co. Waterford; Favour Royal, Co. Tyrone; Armagh (J.).

SCOPARIA ANGUSTEA, *St.*—"Dublin, Howth, August and September; and in May and June hybernated specimens" (B.); Armagh (J.).

SCOPARIA ATOMALIS, *Dbl.*—Howth; Markree Castle, Sligo.

SCOPARIA PALLIDA, *St.*—Howth (B. and G. V. H.); Drumreask, Co. Monaghan; Armagh (J.); Belfast, abundant (W.); Ballinac, Co. Donegal (R.); Dunmore, Co. Waterford.

NOMOPHILA NOCTUELLA, *Schiff.*—Widely distributed, and very abundant where it occurs. Kingstown, and Howth (G. V. H.), Co. Dublin; Glendalough, Connemara; Enniscoe, Co. Mayo; Cappagh, Co. Waterford; and Minehead are some of the places where I have seen it extremely numerous.

PYRAUSTA PURPURALIS, *L.*—Common and widely spread.

PYRAUSTA OSTRINALIS, *Hb.*—Common and widely spread.

RHODARIA SANGUINALIS, *L.*—Locally abundant in the Co. Galway, namely, Ardahan, Kilcornan, and Merlin Park; Dromoland Castle, Co. Clare; and probably also elsewhere on the similar limestone pastures of "the Burren" in that county.

HERBULA CESPITALIS, *Schiff.*—Common, and widely distributed on dry pastures throughout Ireland.

ENNYCHIA CINGULATA, *L.*—Very local and rare. Ardahan (Miss N.) and Ballinahinch, Co. Galway; Knocknarea, near Sligo (R.); Carrickfergus, Co. Down (W.).

ENNYCHIA NIGRATA, *Scop.*—Specimens have been taken at Galway (C. G. B.) and Clonbrock (R. E. D.); and Magilligan, Co. Derry.

ENNYCHIA OCTOMACULATA, *Fb.*—Fairly abundant, but very restricted in distribution. Kilcornan (B.), Ardahan, and Ballinahinch, Co. Galway; on the banks of the Roughty River, and the valley above Kenmare, Co. Kerry.

AGROTERA NEMORALIS, *Scop.*—Near Sligo (R.).

ENDOTRICA FLAMMEALIS, *Schiff.*—Galway (B.).

EURRHYPARA URTICATA, *L.*—Common everywhere.

SCOPULA ALPINALIS, *Schiff.*—Giant's Causeway, Antrim (E. M. M. ii. 261).

SCOPULA LUTEALIS, *Hb.*—Often very abundant and widely distributed. Various localities in the counties of Dublin, Louth, Armagh, Derry, Donegal, Sligo, Galway, Westmeath, Tyrone, &c.

SCOPULA OLIVALIS, *Schiff.*—Everywhere abundant.

SCOPULA PRUNALIS, *Schiff.*—Everywhere abundant.

SCOPULA FERRUGALIS, *Hb.*—Abundant on the coast near Dublin (B.), as at Howth. The only other localities of occurrence that I know elsewhere are Drumreask, Monaghan Favour Royal, Tyrone; and Berehaven, Co. Cork (*Ir. Nat.* iii. 198).

BOTYS PANDALIS, *Hb.*—Rare. Galway (B.); single specimens at Ardahan, and Dromoland Castle, Co. Clare; Enniskillen (*Partridge*).

BOTYS RURALIS, *Scop.*—One near Sligo (McC.); Cork, very abundant (S.).

BOTYS FUSCALIS, *Schiff.*—Common everywhere.

EBULEA CROCEALIS, *Hb.*—"Howth, Dublin, Wicklow, Galway" (B.).

EBULEA SAMBUCALIS, *Schiff.*—Appears to be generally distributed. I, however, have never met with it.

SPILODES STICTICALIS, *L.*—"Howth, by Dr. Wright" (B.).

PIONEA FORFICALIS, *L.*—Common universally.

OROBENA STRAMINALIS, *Hb.*—Abundant locally. Cavan (B.); Favour Royal, Tyrone; Enniskillen; at Markree Castle, and near Sligo (R.); Cromlyn (*Mrs. B.*), and Killynon, Co. Westmeath; Killarney (B.).

CATACLYSTA LEMNATA, *L.*—Common everywhere.

PARAPONYX STRATIOTATA, *L.*—Widely distributed, but somewhat local. Drumreask, Monaghan; and very abundant on the Grand Canal near Athy, &c.

HYDROCAMPA NYMPHÆATA, *L.*—Very common.

HYDROCAMPA STAGNATA, *Don.*—Very common. Stainton, in his 'Manual,' refers to a pale variety as follows:—"Mr. Bond has specimens of a pale variety in which the inner line and subterminal line are obliterated. They were taken near Cork, and perhaps may be a distinct species." This I have taken on the shores of Lough Oughter at Farnham, Co. Cavan; at Castle Bellingham, Co. Louth; and on the banks of the Brosna where it enters the Shannon in King's Co. It is evidently only a variety, as every grade of obliteration occurs to a pure white form (at Lough Oughter especially), upon which the only markings that remain are traces of the discoidal marks.

ACENTROPUS NIVEUS, *Oliv.*—Occurs in the same locality at Lough Oughter in some abundance. Also is extremely abundant at Belleisle on the Upper Lough Erne; and is also numerous in parts of the Lower Lough below Enniskillen.

PTEROPHORI.

PLATYPTILIA BERTRAMI, *Rössl.*—Widely distributed, but local. **H**owth (*G. V. H.*), Kingstown, and the "Strawberry-beds" near **L**ucan, Co. Dublin; Farnham, Co. Cavan; Armagh (*J.*); and **L**ocal near Belfast (*W.*); Glendalough, in Connemara; near **S**ligo (*R.*); Coolmore, Co. Donegal (*J.*); Dunmore, Co. Waterford, &c.

PLATYPTILIA ISODACTYLUS, *Zell.*—Local, but abundant in its **h**abitats. Birchall found it sparingly in Cromaglaun Glen, near **T**ower Lodge, on the Upper Lake of Killarney, in August. It **a**lso occurs on the opposite shore, in marshy spots at the foot of the Eagle's Nest Mountain, where I took it in some numbers, **i**n company with *W. Salvage*, in the first week in June. I have **a**lso specimens from Markree Castle, Co. Sligo, and Moycullen, Co. Galway.

PLATYPTILIA GONODACTYLA, *Schiff.*—Howth and Clontarf, Co. Dublin (*B.*); abundant near Belfast (*W.*); Armagh (*J.*). I have specimens from other localities, but unfortunately have **l**ost the label references.

PLATYPTILIA TESSERADACTYLA, *L.*—In June, 1895, I took, at **A**rdrahan, two plumes which I thought to be like *P. zetterstedti*. The following year, at Clonbrock, in the same county, when in company with the Hon. R. E. Dillon, I met with two species of **p**lumes, in a clearing of a plantation where *Antennaria dioica* grows plentifully. One proved on inspection to be *Aciptilia tetradactyla*, and the other, of which I took a series of five or six, I recognized to be the new species met with at Ardrahan. Mr. Dillon recognized it at once as one which occurred numerously about that clearing, and showed me in his store-boxes a series captured there a year or two before. When sending a box of *Eupithecia* and Micro-Lepidoptera to Mr. C. G. Barrett subsequently, I put in a specimen, which was in due course identified by him and Lord Walsingham as *tesseradactyla*, *L.* A third locality has been discovered this year, namely, Dromoland Castle, Co. Clare, the seat of Lord Inchiquin. It appears, however, to be scarce there, for in the present summer I repeatedly searched considerable areas covered with the food-plant, but in vain; till one evening the Hon. Edward O'Brien caught a single specimen on the edge of a plantation. From the similar character of these three localities, so widely apart, it is probable that many other stony pasturages of the west of Clare and Galway may preserve settlements of this moth, elsewhere unknown in the British Islands. It is easily disturbed from the food-plant on a sunny day. Mr. Dillon and myself transplanted some large sods of the food-plant in the autumn, with the result that he introduced a small colony of these plumes into another part of the Clonbrock

demesne. Most of my plants, however, were scratched up by rabbits at Drumreaske, so that probably I have failed in my first attempt at colonization.

AMBLYPTILIA ACANTHODACTYLA, *Hb.*—Near Sligo (*R.*), a light reddish form which Mr. Tutt refers to this species rather than to the *cosmodactyla* of Hübner, which they more nearly approach in colour (*Pterophorina* of Britain). About Belfast they are generally distributed, though rare (*W.*); Wicklow (*G. V. H.*); Killarney (?); see below.

[*AMBLYPTILIA COSMODACTYLA*, *Hb.*—Birchall records "*punctidactylus*" from Killarney. Probably referable to the above.]

OXYPTILUS PARVIDACTYLUS, *Haw.*—Knocknarea, near Sligo (*R.*); and Carrickfergus, Co. Down, abundant (*W.*).

MIMÆSEPTILUS BIPUNCTIDACTYLA, *Haw.* (*plagiodactylus*, *Sta.*).—A very common scabious plume throughout Ireland, where scabious is extremely abundant.

MIMÆSEPTILUS PTERODACTYLUS, *L.*—Widely spread and common. Kingstown and elsewhere in Co. Dublin. On the coast near Wexford; Cappagh and Dunmore, Co. Waterford; Killarney; Sligo (*R.*); Clogher Head, Co. Louth, &c. Birchall gives "Howth and Belfast," but it is questionable whether this refers to this species or to *Pterophorus monodactylus*, *L.*, of which this was formerly considered a synonym. Mr. Watts has taken it plentifully on Black Mountain, Belfast.

EDEMATOPHORUS LITHODACTYLUS, *Tr.*—This species does not seem common in Ireland. Galway, (*B.*); Fermanagh (*G. V. H.*); Queenstown, Co. Cork; Drumreaske, Monaghan.

PTEROPHORUS MONODACTYLUS, *L.*—Everywhere distributed and apparently not solely a convolvulus-feeder, as it is very numerous in many wild barren districts, from which this plant is absent. I have often met with the imago at ivy blossom in October and November, so that it doubtless hibernates.

ACIPTILIA TETRADACTYLA, *L.*—Local, and in some places not uncommon. It is to be found in many localities in the County of Galway, as at Moycullen, Clonbrock, where it flies in some numbers with *Platylptilia tesseradactyla*; Ardrahan, &c. Also not rare at Dromoland Castle, Co. Clare; Island Magee, Co. Down (*W.*); Castle Bellingham, Co. Louth.

ACIPTILIA PENTADACTYLA, *L.*—This insect, so numerous and generally well known in England, is only occasionally taken in Ireland so far as I have experience, and I have never met with it in any numbers. Single specimens for the most part have been taken at various places in the southern half of Ireland, namely, with (*S.*); Wicklow Mountains (*B.*); Cappagh, Co. Water-

ford; New Ross, Wexford (*B.H.*); Cork (*B.*); Kenmare (*R.E.D.*); and the valley of the Roughty, Co. Kerry; Ardahan and Moycullen, Co. Galway; and near Sligo.

ALUCITA HEXADACTYLA, L.—Everywhere common throughout Ireland, and sometimes extremely numerous, especially in the second emergence.

(To be continued.)

AMONG THE BUTTERFLIES AND FLOWERS OF NORWAY.

By R. S. STANDEN, F.L.S., F.E.S.

(Concluded from p. 196.)

SHORTLY before quitting our hospitable friends of Saeterstøen one of our party—I may be allowed to allude to him as the learned and indefatigable Doctor—left us for the far north, for Bosekop in the Alten Fjord, a six days' journey, with I know not what mythological Erebias and Argynnidæ at the end of it. We would have given much to be able to follow him; we knew how we should miss his playful sallies and his erudite conversation; but weighty considerations intervened, and we decided to leave it for a future expedition. The wisdom of this decision was confirmed shortly after, when we heard that most of the good things there were in very poor condition, and we concluded that it is futile to attempt to combine both N. and S. Norway in one excursion.

In the meantime we had still ten days to dispose of before the departure of the inevitable steamer; so we returned to the capital, and spent a most agreeable evening (with relatives of the writer resident there) at Holmen-Kollen, a favourite resort of the citizens on high ground eight miles out of the city, where suppers are supplied and delightful views obtained over the famous Fjord. In the afternoon, after visiting most of the objects of interest, including the Viking ship and the Antiquity and Natural History Museums, my companion had called on Professor Blyth—an authority on mosses. From the bryologic point of view, he suggested Kongswold in the Dovrefjeld, near Snehætten; as this, however, was a three days' journey, we decided to place it in the same category with Bosekop, and eventually hit upon the happy medium of Bolkesjö—a hill resort in Telemarken, about 1700 ft. above sea-level, and some seventy miles W. by S. of Christiania.

There is a perfectly charming deliberation in all the Norwegians do; they are never in a hurry; and so the express train to Kongsberg, *viâ* Drammen, took 4½ hours to accomplish the fifty miles: thence we went by *stolkjærre*—a terribly rickety

conveyance carrying our four portmanteaus and the driver on a sort of protruding platform behind—to Bolkesjö, eighteen miles, in 4½ hours. The road seemed to have been constructed on the bee-line principle; a few yards to right or left would often have made a comparatively level track of a deeply accented switch-back, but this would not have been consistent with the hardy Norseman's contempt for obstacles, so we had to do at least half the journey on foot. At five kilometers from Kongsberg we left the broad valley of the Laagen—a large river completely choked in one place by countless logs of floating timber several feet deep—and turned off into a steep and very rough road through the forest, which stretched away for miles apparently on either side, with hardly a break, till we reached our destination. In small clearings here and there *Argynnis selene* and *euphrosyne* were as abundant as at Saeterstøen, and *Colias palæno* var. *lapponica* sailed along over patches of very wet marsh covered with *Eriophorum polystachion*, and a smaller species, probably *alpinum*.

The village of Bolkesjö is most romantically situated on the steep incline of a hill above the very large and—as the Germans would say—*fischreich* lake of Folsjö. On the far side of the lake is a long range of fir-clad hills, rising one behind the other, and culminating in the "Gausta"—a leonine-looking mountain of 6180 ft., broadly streaked with snow. The firs are interrupted here and there with bright green slopes, or low-lying meadows, marvellously rich in colour with sorrel and a bronze-tinted festuca; and when the setting sun, with that indescribable translucency peculiar to these latitudes, threw its glamour over the scene, one lost count of time, and sleep and dreams were only trivial incidents in a long day. So dazzling, and at the same time so entirely restful and satisfying, were these sunsets, that the artist of our party was perpetually tearing his hair into metaphorical shreds at his inability to reproduce them. He had this advantage, however, over his brethren of the net, in that he could pursue his art in the delicious cool of the evening, and might more than once have been seen at work up to half-past ten and eleven o'clock.

At our present elevation—and we could work from 1500 ft. to 4000 ft.—it was not unreasonable to hope for a somewhat different fauna to that of Saeterstøen, at the most 400 ft. above sea-level. The only strangers, however, were the rare *Argynnis frigga*, a mile or more beyond and above the hotel, and *Erebia lappona*, on the rocky slopes of the "Blefjeld," a hill 4000 ft. high. The collecting-ground here was all on an incline at angles of from 30° to 45°, and the forest, although rather less boggy, was more fatiguing than at our first station by reason of the slippery character of the pine-needles and rocks on a slope in my own case, the fatal omission of nails in the boots.

The feeling of exhaustion at the end of one long day there I shall never forget; it taught me at all events one useful lesson, to wit, that age has its very well-defined limits of endurance.

The *Argynnis aphirape* (common here also) was, I find, the var. *ossianus* of Herbst, very distinct in the bright silver blotches of the under side, and little more than half the size of the type, of which I have specimens from Germany. The *palæno* also are all var. *lapponica*, Stgr.

I should like here to make an observation on *Erebia embla*, which does not, however, appear to occur at Bolkesjö. Herr Schöyen states that in 1884, 1886, and 1888 he found it in great abundance at Disenaen, but that in 1885 and 1887 he saw none at all. From this he naturally argues that it is a constant biennial, which seems remarkably strange, as it is hard to believe that in the course of ages there may not have been an occasional overlapping. One would like to know how it behaves in Lapland, or whether it has been the object of experiment in captivity, and whether other *Erebias* lie over in the same way.

The flora here was less varied than at Saeterstøen, but many of the same plants were still to the fore; and I may mention two of the more prominent that were omitted in my former paper, viz. a fine form of *Geranium pyrenaicum*, common everywhere, and a lovely crimson dog-rose growing, not in hedges as with us, but in isolated bushes, at not infrequent intervals by the roadside. My fellow-traveller (to whose superior botanical knowledge I was always glad to defer in cases of doubt) pronounces it to be *Rosa cinnamomea*. The last year's berries of *Vaccinium oxycoccus*, the true cranberry, were still lying, attached to their stalks, on the top of the mosses among which they grew, and were still juicy and full of refreshing flavour.

Bird-life seemed to be strangely lacking, both in numbers and variety. The only small birds I noted at Saeterstøen were the common sparrow and the house martin. I also saw four young *Fringillinae*, with grey speckled breasts and thick beaks, roosting on one of the lower branches of a fir, and should have said they were hawfinches, only Dr. Bowdler Sharpe tells me that this species is only a winter visitor in Norway. They were probably the crossbill, *Loxia curvirostra*, L., which breeds largely in Scandinavia, and does not acquire the crossing in the beak till after three weeks old. Of the ordinary song-birds we heard none, although the breeding season can scarcely have been over when we first arrived. Among larger birds, the grey crow and the magpie were abundant, we saw a few wood pigeons, and heard a cornrake and the green woodpecker. In the forest, close to Bolkesjö, we were frequently startled by the superb capercailzie, *Tetrao urogallus*, L., commonly known as the cock-of-the-wood. When the male bird swoops up from the ground, or from the low branch where he has been sitting, and crashes

through the thick foliage, he looks almost as big as a turkey-cock, and the air is filled with the rattling whirr of his big wings. But the female hangs about, looking after her young, and is only languidly alarmed at the apparition of the human biped. On the Blefjeld, which my companion heroically scaled under a blazing sun, he saw ptarmigan, snow bunting, a lark (of which he took one egg, not yet determined), and a tit which he believed to be *Parus norvegicus*.

I hardly dare trust myself to speak of the Diptera. The bare thought of them sets up a sense of urtication from head to foot; but there are only six species for me:—

No. 1.—A big gadfly with apple-green head, fussy and officious—a kind of German “dumme August”—a truly awful buzzer, but an arrant coward if you only fix your eye on him.

No. 2.—A smaller gadfly, less noisy, but with a keen eye to business, prompt and effective, with a proboscis that seems to go right down to the marrow at once.

No. 3.—The most deadly of all; a small dipteran with gauzy grey-speckled wings, and a proboscis like an invisible needle—a furtive and silent pest, that deposits its poison and is off before you know that it has settled.

No. 4.—A handsome, brown-blotched, black and yellow bodied little thing, only a degree less venomous than No. 3.

These are about you in countless swarms all day long, in sunshine and shade alike, and you come home in a state more easily imagined than described. The other two are the homely twilight midge, and the familiar mosquito that hums about your bed at night and counterpoints his melody upon your defenceless brow and hands. And yet, in spite of these torments, which are very real at the time, there is in those vast solitudes—where one may walk for days without meeting a soul—such a sense of freedom, and of the pure enjoyment of nature in one of its grandest forms, and the fascinations of the country and people generally are so great, that all else is soon forgotten, and one is quite ready to renew one's experiences on the first opportunity.

LIST OF RHOPALOCERA NOTED OR TAKEN.

Papilio machaon, L.—A few only, large and fine, at both places.

Aporia cratagi, L.—Abundant, large and strongly veined, at both places.

Pieris brassicae, L.—Fairly common.

P. rapae, L.—One or two noted.

Euchloë cardamines, L.—Common.

Leucophasia sinapis, L.—Very common.

Colias palæo var. *lapponica*, Stgr.—Abundant, both at Saeterstøen and Bolkesjö.

Thecla rubi, L.—Common.

Polyommatus hippothoë, L. and Esper.—A few on the railway bank.

P. phlaeas, L.—Common.

P. amphi-damas, E.—One only, on railway bank.

Lycæna ægon, Schiff.—Common.

L. argus, L.—One male only, on railway bank; dark slate ground colour on under side.

L. optilete, Knock.—Fairly abundant about its food-plant, *Vaccinium uliginosum*, both at Saeterstøen and Bolkesjö.

L. icarus, Rott.—Only one or two; a more metallic blue than the English or continental type. Railway bank at Saeterstøen.

L. amanda, Hb.—Rare at Saeterstøen.

L. argiolus, L.—A few very worn.

L. semiargus, Rott.—Very abundant.

L. cyllarus, Rott.—A few, both at Saeterstøen and Bolkesjö.

Vanessa c-album, L.—One only, very worn, railway bank.

V. urticæ, L.—One or two only of last year's brood.

V. antiopa, L.—A few well-battered specimens at Saeterstøen.

Melitæa athalia, Rott.—Abundant and strongly marked.

Argynnis aglaia, L.—One or two noted at Bolkesjö.

A. euphrosyne, L.—Very abundant everywhere, but not so finely marked as Swiss specimens.

A. selene, Schiff.—Equally common in both places. The railway bank swarmed with them.

A. aphirape var. *ossianus*, Hbst.—Abundant both at Saeterstøen and Bolkesjö. Much smaller than the type, specimens of which I have from Germany without the silver blotches on the under side.

A. freija, Thnb.—One only, at Disenaaen, worn.

A. frigga, Thnb.—Seven or eight, in poor condition, in a clearing of the forest a mile or so above Bolkesjö.

Erebia lappona, E.—Only one, in good condition, on the Blefjeld, about 3500 ft. up.

E. embla, Thnb.—Abundant at Disenaaen and Saeterstøen, but mostly in bad condition, especially the males. This insect did not occur at Bolkesjö, and appears to frequent low-lying marshes only.

Eneis jutta, Hb.—Rather more abundant than the foregoing, and flying about with it, but although, up to the last, we continued to take now and then a freshly emerged example—especially above Bolkesjö, nearly 3000 ft. up—the great majority were sadly worn.

Pararge hiera, Fab.—Common at both places, very small at Saeterstøen, and at both much darker than the Swiss type.

P. egeria var. *egerides*, Stgr.—At Saeterstøen only. Rare.

Epinephele hyperanthus, L.—A few only, and of a rather remarkable form, most of the specimens showing a tendency to approach the aberration *arete* of Ochsenheimer—almost black on the upper side, with the eye-markings of the type entirely effaced; on the under side a slaty grey, with the pupils of the fore wing only faintly visible. This species was taken at both Saeterstøen and Bolkesjö.

Canonympha pamphilus, L.—Very common.

C. typhon, Rott.—Fairly common both at Saeterstøen and Bolkesjö.

Syrichthus centaureæ, Rbr.—Moderately common on the big bog at Saeterstøen, but not in the best condition.

S. malvæ, L.—Common.

Nisionades tages, L.—A few.

Hesperia sylvanus, E.—A few.

N.B.—For *A. freija*, *A. frigga*, *E. embla*, and *Æ. jutta* the collector should be on the ground not later than June 10th.

Thorpe Hall, Colchester: August, 1898.

Since writing the above I have been much grieved to hear of the rather sudden and unexpected death of Professor Blyth, who had broken his leg shortly before we reached Christiania, but was said to be rapidly recovering.—R. S. S.

THE NORTH AMERICAN BEES OF THE GENUS *PROSAPIS*.

By T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

(Continued from p. 192.)

FLORIDA.—*P. schwarzii* was described from a large female taken by Mr. Schwarz; but I have several examples from Mr. Robertson, indicating that the insect varies in size. Mr. Robertson kindly sends me also the male, which is a remarkable insect; the face-marks are cream-colour, the lateral marks long and narrow, pointed at each end, the inner side squarely truncate a little above the level of the top of the clypeus, the further projection along the orbital margin being narrow. The upper margin of the clypeus is broadly black, and there is a short black median downward projection, and long narrow lateral black stripes, separating the light colour of the clypeus from the lateral marks. There is no supra-clypeal mark. The first abdominal segment is smooth, practically impunctate. The punctuation of the thorax is fine and close, not coarse as in *confluens*. Antennæ, hind border of prothorax (except spot on tubercles) and tegulæ wholly dark. Wings strongly infuscated as in the female.

In lacking a supra-clypeal mark in the male, this is like *nevadensis*, but in all other respects that is a totally different insect. It had been formerly questioned whether it might be *confluens* or *elliptica*, but it is in fact wholly distinct from either of them.

I have before me also types of *P. floridana*, Rob., and *P. flamipes*, Rob., both from Florida.

LOUISIANA.—In Coll. Am. Ent. Soc. is a small male, which I can only refer to *modesta*, though one would not look for that species so far south. It is not in the best condition, but it seems to present no good distinctive features.

TEXAS.—Three specimens are in Coll. Am. Ent. Soc., two in U. S. N. M. Of the former, a male is to be referred to *citrinifrons*,

though the face is buff instead of lemon-yellow, and there is yellow on the hind border of prothorax. It might be taken for *modesta*, but for its strongly punctured first abdominal segment, the punctuation being closer than in typical *citrinifrons*. It is, perhaps, a new species, but more evidence is needed before describing it as such.

All the other Texas specimens are females. They are rather large, with the lateral marks constituting broad triangles as in *modesta*, but quite long, rather as in *floridana*, yellow on hind border of prothorax, on tubercles, and spots on tegulæ; first abdominal segment smooth. One differs by having all the light markings pure white; it is probably a variety. It hardly seems likely that this is the female of *citrinifrons*, but I am not prepared to describe it as new.

NEW MEXICO.—In the Mesilla Valley, 3800 ft., we find two species: *mesillæ*, allied to the eastern *pygmæa*; and *asinina*, quite distinct from other U. S. species, and probably of Mexican affinities. The female of *asinina*, described as *bipes*, was first taken in September; it occurs on *Solidago*. This form has yellow face-markings; but in May, Miss Jessie Casad took specimens on mesquite (*Prosopis*) which were somewhat larger, and had the markings so pale as to be practically white. *P. mesillæ*, described from specimens taken in August, also occurs in spring, as early as April, on *Sisymbrium*, &c. On June 30th I took *mesillæ* at Albuquerque. A female taken on *Salix* at Santa Fé, July, appears to be *pygmæa*, agreeing with the Colorado females so referred. It has not the light clypeal spot of *mesillæ*, and the lateral marks are smaller. *P. rudbeckiæ* was originally described from Sta. Fé. On a crucifer on Tuerto Mtn. near Sta. Fé, at 8550 ft., August 7th, I took a female differing from any seen at Sta. Fé (7000 ft.), and quite similar to *varifrons* female, except for the strongly and closely punctured first abdominal segment. The tegulæ have a light spot. This is clearly distinct from any female *Prosopis* described, but I will not propose a name for it, as it probably belongs to one of the described males.

On *Monarda fistulosa* at Monument Rock, Sta. Fé Cañon, 8000 ft., August 11th, I took a female *varifrons*. It has the wings rather darker than usual, and so looks like the Florida *schwarzii*.

Prof. E. O. Wooton took a remarkable series of *Prosopis* on *Scrophularia*, Ruidoso Creek, 7500 ft. From the males of this lot were described *P. wootoni*, *P. tridentula* (also Colo.), and *P. rudbeckiæ* race *ruidosensis*. The females are of two types—one like *varifrons*, the other like *modesta*; the former has, the latter lacks, the spot on tegulæ. In both the first segment of the abdomen is smooth. I infer, but cannot assert, that the *varifrons*-

like female belongs to *tridentula*, and the *modesta*-like one to *wootoni*.

COLORADO.—Mr. C. F. Baker has collected a surprising number of species, showing apparently that the higher elevations in this State are the metropolis of the genus in the U. S. From the males I have described *P. bakeri* (7000 ft.), *citrinifrons* (8500 ft.), *tridentula* (9500 ft.), *rugosula* and var. *fallax* (9500 ft.), *tridens* (7000 ft.), *divergens* (7000 ft.), *episcopalis*, *coloradensis* (9500 ft.), *digitata*, and *rudbeckiæ* race *subdigitata*. I have also recognised amongst Mr. Baker's Colorado material the described species *basalis*, Sm., *varifrons*, Cr., and *pygmæa*, Cr. I have taken *P. mesilleæ*, Ckll., on *Cleome serrulata* at La Junta, Colo., but that is on the plains. *P. affinis*, *modesta*, *elliptica*, and *verticalis* have been recorded from Colorado; *elliptica* is probably found there; but the others have probably been erroneously identified from such allied forms as *citrinifrons*, *tridentula*, &c. In the U. S. N. M. is a specimen taken by the writer in Custer Co., Colo., a female. It is of the *varifrons* type, but has a broken pale band on anterior edge of clypeus. The tegulæ have a light spot. I suppose it is *varifrons*, but it approaches *elliptica*.

MONTANA.—The U. S. N. M. contains two females of the *varifrons* type, presumably that species. Both have the hind border of prothorax dark, and the spot on tegulæ.

UTAH.—The Coll. Am. Ent. Soc. contains male *varifrons* and female *basalis*.

IDAHO.—The U. S. N. M. contains two female *varifrons*, collected by Prof. L. Bruner in Beaver Cañon. One has the hind border of prothorax partly light, the other has it all dark; the latter lacks the spot on tegulæ.

NEVADA.—Two species, *suffusa* and *nevadensis*, are known only from Nevada. A female from Nevada, in Coll. Am. Ent. Soc., is of the *varifrons* type, with spots on tegulæ, but there is a large rufescent patch on the anterior part of the clypeus. The first abdominal segment is smooth.

CALIFORNIA.—*P. coquilletti* is a distinct species from Los Angeles Co. A female collected by Coquillett, also in Los Angeles Co., seems to belong to it; it has the lateral face-marks much as in *varifrons*, only shortened and abruptly rounded above. The anterior part of the clypeus is obscurely rufescent.

Male specimens from Cala. in Coll. Am. Ent. Soc. represent four species, thus:—

(1.) *P. bakeri*, Ckll. With all the distinctive characters of this well-marked species, but the wings are browner than in the type.

(2.) *P. ruidosensis*, Ckll., var. with spot on tegulæ. One of the slightly modified *rudbeckiæ* types; from a single specimen

we cannot determine whether there exists a distinctive Californian race.

(3.) *P. suffusa*, Ckll., var. with the face more lemon-yellow. The abdomen is strongly punctured. Tegulæ all dark; tubercles with a yellow speck.

(4.) *P. tridentula*, Ckll. The clypeus is somewhat shorter than in the Colo. type.

A female, which I can only refer to *P. mesillæ*, is in the U. S. N. M. from Los Angeles Co., collected by Coquillett.

In Coll. Am. Ent. Soc. are several examples of a remarkable female form, with the lateral face-marks triangular, quite broad and short, rather of the *modesta* type, but the clypeus with a broad yellow vertical stripe, or even wholly yellow except the sides, which may then become rufescent. The tubercles are light, and the tegulæ have a spot. I had held this to be the hitherto unknown female of *bakeri*, but I do not find it among Mr. Baker's Colorado collections.

A female from Placer Co., Aug. (A. Koebele), in U. S. N. M., is of *varifrons* type, but the lateral face-marks are reduced to mere specks. The tubercles have a yellow spot, with a black speck on it, but the tegulæ are wholly dark. The wings are tinged brownish. A female in Coll. Am. Ent. Soc. looks like *varifrons*. The tegulæ have a very small obscure spot.

OREGON.—There is a male *P. divergens* in Coll. Am. Ent. Soc.; it differs a little from the Colorado type, but is hardly to be described as a distinct variety, I think.

WASHINGTON STATE.—A male *mesillæ* is in Coll. Am. Ent. Soc.; I was quite surprised to see it from so far north. As shown above, this species is also found in Cala.

VANCOUVER I.—The Coll. Am. Ent. Soc. contains a male *P. citrinifrons* and a couple of female *basalis*; also a female of the *varifrons* type, with dark tegulæ, like the Californian form mentioned above.

MEXICO.—I have before me males of *mexicana* and *grossa*, sent by Mr. Baker. Cresson describes *azteca*, *dubiosa*, *mexicana*, and *grossa*, all obtained by Sumichrast at Orizaba. Smith's *maculipennis* and *trepanda* are from Oajaca.

It will be seen from the above review how little we know about the females of N. American *Prosapis*. It is evident that the numerous females of the *varifrons* type, which might be thought to belong to a single species, almost certainly should be referred to several species having easily recognisable features in the male.

(To be continued.)

NOTES AND OBSERVATIONS.

RAPID METAMORPHOSIS OF DREPANA FALCATARIA (PLATYPTERYX FALCULA).
—On Saturday, July 9th, I found a few full-grown larvæ of *Platypteryx fulcula* on Wimbledon Common, and by Saturday morning, July 23rd, two of the imagines had emerged, taking a few hours less than a fortnight in changing from larva to imago. They were kept in the house in a glass cylinder, and I did not remove the pupæ until a day or two before the perfect insects came out.—A. W. MERA; 79, Capel Road, Forest Gate.

LEPIDOPTERA AT SEA.—Yesterday and to-day the ship has been swarming with *Nomophila noctuella*. I have seen them every day since we left Gibraltar on the 11th inst., but it is only since yesterday that they have appeared in such large numbers. The weather during our cruise has been almost perfectly calm, and what little breeze we have occasionally had has been from the south-east. Yesterday, at noon, the nearest land, Cape Caccia, Sardinia, was eighty-two miles north-east of us, and this morning at eight o'clock we were some twenty-five miles north of Corsica. Besides this species I have noticed several *Pyrameis cardui*, *Macroglossa stellatarum*, *Plusia gamma*, and *Scopula ferrugalis*. We arrived at this place at four this afternoon.—GERVASE F. MATHEW, H.M.S. 'Hawke,' Leghorn, Aug. 16th, 1898.

CAPTURES AND FIELD REPORTS.

ACIDALIA HERBARIATA.—On the afternoon of July 21st last I caught a beautiful specimen of this insect at rest on the wall inside a shop in Southampton Row, Bloomsbury.—SELWYN IMAGE; 6, Southampton Street, Bloomsbury, W.C., Aug. 8th, 1898.

[*Acidalia herbariata* was included by Stainton in his 'Manual' on the strength of "a specimen taken near Bedford Square," which at the time (1859) was in "Mr. Hunter's collection." In 1869 Mr. E. G. Meek (Ent. Mo. Mag.) records the capture of "three or four specimens." These were taken in the month of June in a herbalist's shop in Holborn. Ten years later Mr. Coverdale, on July 22nd, found one example "in fine fresh condition" resting on a door-post in Cannon Street (Entom. xii. 226). There was a specimen in the late Mr. Wellman's collection, which was sold at Stevens's auction rooms on July 10th, 1894, noted in the catalogue as having been taken on a shop-window in Oxford Street in 1873. So far as can be ascertained by a rather hasty search through our journals, &c., the foregoing are all the British *A. herbariata* about which we have any direct information. Of the "three or four specimens" taken in Holborn, two, we are told, went into the collection of the late Mr. Bond, and one was a worn female. Then we have the three specimens that were contained in the collection of the late Rev. H. Burney, sold at Stevens's in November, 1893, and the Coverdale and Wellman examples—making a total, in all, of nine specimens. Mr. Tutt, however, in his 'British Moths,' p. 243, referring to *A. herbariata*, states: "Perhaps all the known British specimens do not amount to more than six, of which three, caught by Mr. Coverdale in Cannon Street, are in

my own collection." The most complete life-history of this species we have any knowledge of is that by Dr. Heylaerts (Ann. Ent. Belg. xxi. pp. 5-8). The eggs, securely fastened on the dry or withered plants upon which the larvæ feed, were deposited at the end of June; the larvæ hatched out early in August, continued to feed through autumn, winter, and following spring; commenced to pupate towards the middle of May, and the imagines emerged in June and July. There were four moults; the first change took place about the middle of September, the second early in November, the third on December 20th, and the fourth early in April. Dr. Sorhagen (Berl. Ent. Zeit. xxv. p. 17) states that from larvæ obtained in April perfect insects were produced in May. Guenée remarks that the larva appears to have been only met with in herb or drug stores, and that the imago occurs in gardens and houses in July and August.—Ed.]

COLIAS EDUSA IN DECEMBER.—A few days ago a young friend of mine showed me a rather large male example of *C. edusa* in good condition which he informed me he had taken at St. Leonards in the second week of December, 1896. He was going to school one morning, when he perceived the butterfly hovering over the snow by the side of the road, apparently seeking some resting place; and secured it without any trouble, as it seemed in a somewhat dazed condition.—H. W. SHEPHEARD-WALWYN; Bidborough, Tunbridge Wells.

EUPITHECIA VENOSATA AND DIANTHÆCIA CUCUBALI AT BALHAM.—Referring to Mr. South's note (*ante*, p. 197) respecting *C. venosata* occurring at Balham, I may mention that larvæ of this species and also larvæ of *Dianthæcia cucubali* occur at Balham amongst *Silene inflata*. I only noticed the former last year for the first time, but larvæ of *D. cucubali* I have taken there on and off for the last ten years. On the other hand, the larva of *D. carpophaga*, usually the commonest on *S. inflata*, I have never met with at Balham, although it occurs near by, at Streatham.—H. ROBSON; 135, Louisville Road, Upper Tooting.

HESPERIA LINEOLA NEAR BEDFORD.—On July 25th, when collecting outside some woods about two miles from Bedford, I took half a dozen small skippers. Of these five are *Hesperia thaumas*, but the sixth has been identified by the Rev. G. H. Raynor as being undoubtedly *H. lineola*.—E. A. S. HATTON; Ullesthorpe, St. Michael's Road, Bedford, Aug. 15th, 1898.

COLLECTING IN SOUTH-EAST KENT.—On July 2nd I left London for a short tour to Hythe, *viâ* Hastings, Ore, Rye, Appledore, and Ashford; and I visited Shorncliffe, Sandgate, Saltwood, Lymne, and Folkestone while staying at Hythe. The weather was exceptionally fine, and although I cannot record many rare captures, I obtained one hundred and thirteen different species, twenty-seven being butterflies. The following is a list of the more important captures, with localities, &c.:—*Gonepteryx rhamni*, Hythe and Appledore (pupæ). *Argynnis aglaia*, Hythe (larvæ). *A. adippe*, Hythe and Appledore. *A. selene*, Hastings, Fairlight Glen (plentiful). *A. euphrosyne*, Hastings (plentiful). *Vanessa cardui*, Cheriton, Folkestone (hibernated). *Melanargia galatea*, Hythe (pupæ, obtained by sweeping). *Thecla quercus*, Appledore (in distant oak wood). *Lycena bellargus*, Cheriton, Folkestone. *L. argiolus*, Rye. *L. minima*, Warren, Folkestone (plentiful). *Syrichthus malva*, Appledore and Folkestone. *Nisoniades*

tages, Ore, and the Warren, Folkestone. *Hesperia thauwas*, Appledore. *Sphinx ligustri*, Hythe (at rest). *Charocampa porcellus*, Appledore (came to light). *C. elpenor*, Appledore (came to light). *Smerinthus populi*, Hastings (at rest). *Trochilium crabroniformis*, Appledore (plentiful in an osier-bed). *Sesia tipuliformis*, Appledore (in a garden). *Zygæna loniceræ*, the Warren, Folkestone. *Zygæna filipendulæ*, Appledore, and Warren, Folkestone (pupæ, plentiful); var. *hippocrepidis*, Appledore (pupæ): I obtained seven specimens of this variety from among about 220 pupæ of *Z. filipendulæ*, which were set at liberty as they emerged. *Earias chlorana*, Appledore (sparsely, in osier-beds). *Nudaria senex*, Appledore (on the marsh, very plentiful). *Lithosia muscerda*, Appledore (on the marsh). *Spilosoma urticæ*, Appledore (by the canal). *Zeuzera pyrina*, Lymne, Hythe. *Leucoma salicis*, Appledore (very common, in all stages). *Bombyx rubi*, Ashford. *Dicranura furcula*, Appledore (osier-bed, larva). *D. vinula*, Appledore (larvæ). *Lophopteryx camelina*, Saltwood, Hythe. *Notodonta ziczac*, Appledore (larva). *Acronycta tridens*, Appledore (at rest). *A. aceris*, Sandgate (male and female, pairing). *Leucania pallens*, Shorncliffe (disturbed while sweeping). *Hadena oleracea*, Appledore. *Anarta myrtilli*, Ashford (flying outside station). *Euclidia glyphica*, the Warren, Folkestone (plentiful). *Catocala nupta*, Sandgate (larvæ). *Pericallia syringaria*, in a wood near Ashford. *Geometra papilionaria*, Lymne, Hythe. *Acidalia inornata*, Appledore (male and female). *A. imitaria*, Hythe (plentiful). *Timandra amataria*, Hythe (plentiful). *Eupithecia rectangulata*, Shorncliffe (plentiful). *Anticlea cucullata*, Hythe (West), (four males and one female). *Cidaria associata*, Appledore and Folkestone. Sugaring seemed to be of no service this year; the best insects were mostly taken by casual searching in the day. Insects came well to light, but there were no particularly rare species, excepting *C. porcellus*. Sweeping on Romney Marshes was fairly profitable; though the best insects taken were the pupæ of *M. galatæa*. A collector I met informed me that he had seen *Apatura iris* in a small wood at the back of Hythe in 1897.—LINDEN HEITLAND; Amberley House, Crouch Hill, London, N., Aug. 12th, 1898.

MACROGLOSSA BOMBYLIFORMIS, Ochs. (=FUCIFORMIS, Staint. Newm.) AT OXSHOTT.—On August 13th last I found twelve larvæ of this species on an isolated patch of honeysuckle growing among the heather a short distance from Oxshott station. They were mostly full grown. About a mile further on a much larger quantity of honeysuckle was met with but although this was closely examined only one larva of *M. bombyliformis* was detected. In walking through the heather and bracken *Plusia gamma* darted up in front of one at almost every step.—RICHARD SOUTH, 100, Ritherdon Road, Upper Tooting.

A PLAGUE OF WHITE BUTTERFLIES.—For several days past the gardens here have been infested with the greatest plague of these I have ever yet seen; nine-tenths of them being *Pieris rapæ*. With a view of reducing the crop of caterpillars later on, I have kept a boy almost constantly going with the net. During the last two days he totalled 268 of them, on one occasion he took five at one stroke. At present there is but little diminution in their numbers. —GEORGE WALL; Grim's Dyke; Harrow Weald, Aug. 18th, 1898.

LEUCOMA SALICIS IN LONDON DISTRICT.—On July 7th last I found two larvæ of *L. salicis* on a poplar tree on Wandsworth Common; both subse-

quently proved to be ichneumonid. Mr. Armstrong, who collected in the district referred to between the years 1860 and 1872, informs me that the species used to be abundant both on the common and in Battersea Park.—RICHARD SOUTH.

EURRHYPARA URTICATA FEEDING ON MINT.—In September, 1897, I found a number of the larvæ of this species on garden mint in this neighbourhood. They hibernated in cocoons in the usual way, and did not pupate until about three weeks before the perfect insect emerged, which latter event occurred early in July of the present year.—RICHARD SOUTH.

DIANTHÆCIA CAPSINCOLA.—Larvæ of this species have been unusually abundant this year on sweet-william in the garden here. Almost every seed-head was tenanted. Considered from an economic point of view, *D. capsincola* should probably be included among injurious insects.—RICHARD SOUTH; Upper Tooting, S.W.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—The meetings, which have been suspended during August on account of redecorating rooms, will be resumed on Thursday, September 8th, and continued on the subsequent second and fourth Thursdays in each month as heretofore.

KENDAL ENTOMOLOGICAL SOCIETY.—August 8th, 1898.—Rev. A. M. Moss, President, in the chair. The meeting was well attended, twenty-two being present, and six new members were elected, bringing the roll of membership up to the encouraging figure of thirty-six. The chief business of the evening was to discuss the district to be worked by the Society, and this with a view to forming a model museum collection, together with a reliable, up-to-date list of the Macro-Lepidoptera of the adjoining country. Such an undertaking, it was felt, would be of invaluable aid and interest to all, if restricted to a limited area. From the geological nature of the country it was seen at once that county boundaries could not be adhered to, so it was resolved that the district recognized by the Society should include a radius of twenty miles round Kendal. The district, therefore, while comprising nearly the whole of Westmoreland, takes in also parts of Cumberland, Yorkshire, and North Lancashire. It was also resolved that, in the event of a local species being found a few miles beyond the assigned district, and yet in more or less similar country, it should be recorded; the only condition being that the precise locality be given. Mr. Holmes exhibited series of *Argynnis aglaia*, *A. adippe*, *Erebia epiphron*, *Lycæna ægon*, and *L. salmacis*, one specimen of the latter, a female, showing the orange spots on the right side much lighter than on the left; it was noticed by several that the females of *L. ægon* taken this year on Brigsteer Moss are smaller than those taken last year. Mr. Moss, larvæ and pupæ of *Nemeobius lucina*, bred from ova; also drawers of Nymphalidæ and Satyridæ, and box of recent captures &c., embracing vars. of *Aplecta herbida* and bred species of

Noctua triangulum and *Triphena fimbria*. Mr. Smith, *Platypteryx lacer tula*, *P. falcata*, and some fine forms of female *L. alexis*; also a variety of *Cænonympha davus*, male, dark bronze with unequal splashes of light colour. Mr. Wright, recently caught *A. aglaia* and *A. adippe*.—ARTHUR MILES MOSS, Sec.; 12, Greenside, Kendal.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—July 18th, 1898.—Mr. A. H. Martineau, in the chair. The chairman showed larvæ of *Dytiscus marginalis* from Ribbesford; also a *Nematus* one antenna of which had a white ring near the tip and the other was all black; he believed it to be gynandromorphous. Mr. Bradley, *Megachile willughbiella* and *M. centuncularis*, male and female of both, obtained from a post near Sutton. Mr. W. Bowater, a specimen of *Odynerus pictus* which had made its nest behind a picture in his bedroom at Edgbaston. The cells, which were broken, contained about three dozen larvæ of one of the sawflies. Mr. Willoughby Ellis recorded the occurrence, at Haywood near Solihull, of *Strangalia armata*, *Pterostichus striola*, *Aphodius fossor*, *Clythru quadripunctata*, *Melanotus rufipes*, and *Serica brunnea*, the last occurring on sugar.—COLBRAN J. WAINWRIGHT, Hon. Sec.

RECENT LITERATURE.

Fauna Regni Hungariæ. III. Arthropoda-Hemiptera. Conscriptit DR. G. HORVÁTH (subordo Aptera a R. KOHAUT). Reg. Soc. Sci. Natur. Hungarica. Budapest, 1897. [Editio separata.]

THE thousandth anniversary, last year, of the founding of the Hungarian monarchy has been commemorated by Hungarian zoologists in the publication of a series of catalogues of the fauna of their country. Dr. Horváth has been good enough to send me his contribution on the Rhynchota. I call attention to it in the 'Entomologist' as it seems to me to be well worthy of serving as a model for future faunistic catalogues. It is preceded by an historical preface in Magyar and Latin (in parallel columns), and a bibliography of one hundred and ninety-nine papers, of which Dr. Horváth himself has contributed eighty. Appended is a coloured map, divided into eight numbered sections, referred to in the list of species under the numbers. British rhynchotists will be interested to note that 1643 species (including Mallophaga, &c.) are recorded; of these 814 belong to the Heteroptera, a suborder of which we have only about 440 species in the British Isles. Of the Auchenorrhynchos Homoptera and Psyllidæ 502 are enumerated, our British list numbering 200 less.

Dr. Horváth is always so refreshingly up to date in his nomenclature, that it seems captious to note a slight error on page 81 in the enumeration of the Gerrididæ (a name which the distinguished author rightly substitutes for the usual "Hydrometridæ"), viz. the correct name of *Gerris costæ*, Herrich-Schäffer, is *G. lateralis*, Schummel, the latter having twenty-four years' priority.

G. W. KIRKALDY.

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HIPPOBOSCA EQUINA, LINN., AT YSTALYFERA, GLAMORGANSHIRE.

By ELEANOR A. ORMEROD, F.E.S.



HIPPOBOSCA EQUINA, 1 and 2, nat. size and magnified from life; 3, pupa removed from egg-like puparium (after Réaumur); 4, puparium, nat. size and magnified, before complete colouration.

ON August 18th I received a letter from Dr. D. Thomas (Medical Officer of Health) from Tyr-waun, Ystalyfera, Glamorganshire, South Wales, asking my opinion on some specimens enclosed, of which he observed that "they are known in this district as 'Forest Flies.' They are a perfect terror to horses, some animals becoming quite beyond control. Fortunately, according to my experience, they are not very frequently met with. I have generally found them in the parish of Ystradgynlais in Breconshire, among hillside farms, where there is plenty of scrubby timber."

ENTOM.—OCT. 1898.

The specimens sent me by Dr. Thomas were obviously (and at a glance) our "Forest Fly," the special pest of the New Forest, of which I saw only too many in the year 1895, when the circumstance of the autumn manoeuvres being in that district brought the habits of the pest under special observation; and careful comparison, both with descriptions and types, showed these specimens, now sent by Dr. Thomas, to be *Hippobosca equina*, Linn.

Thus, in addition to the English head-quarters of the species in the New Forest in Hampshire, we have the subordinate localities of the valley between Portmadoc and Beddgelert in North Wales, from which I received specimens in 1895, taken by the driver of one of the coaches off one of the horses going to and fro between the above localities; also the Ystalyfera locality, from which specimens have now been sent. And as Dr. Thomas mentions having "*generally*" found this fly (of which he now sends samples from Ystalyfera) in the parish of Ystradgynlais in Breconshire, this might, I think, be fairly considered as yet another locality.

Torrington House, St. Albans: Sept. 1898.

A NEW SPECIES OF *CHARAXES*.

By PERCY I. LATHY.

Charaxes gamma, sp. nov.

♂. Fore wings blackish brown. Just beyond cell crossed by a series of five pale yellow spots, the first being just above first median nervule, the second minute and nearer hind margin, between first and second median nervules; the remaining three larger, the third being between second and third median nervules; and the fourth and fifth, which adjoin, between the third median nervule and submedian nervure. Beyond this series, and in the same position to the nervules, are five more pale yellow spots, arranged in a straight line, all of which but the second are smaller; above and on each side of the upper spot of this series are two pale yellow spots, so placed that they form, with the five, a Y; the lower of the two spots forming the branch of Y next hind margin minute; hind margin faintly yellowish between nervules. Hind wings blackish brown; a pale yellow band across the middle, extending from costa to first median nervule. A series of submarginal pale yellow markings, of which the upper are large and round, the two next anal angle being mere lines; within these submarginal markings three dull greenish yellow lunules, situated respectively between first and second and second and third median nervules, and third median nervule and submedian nervure; hind margin faintly yellowish between nervules. Antennæ black, end of club orange-brown. Under side: Fore wings silvery; a conspicuous

dark olive-brown band crossing cell near base, another dark band just beyond crossing whole fore wing; beyond this band a pale area, where the markings of the upper side, particularly those near inner margin, may be distinguished; within this pale area a large inverted triangular olive-brown marking, the apex being situated on lower discoidal nervule and the base on costa; close to the side of this triangle next the base are three small black spots, of which the upper is nearer the base than the second, and the second nearer than the third; also within pale area is a wide olive-brown band, inwardly broadly bordered with blackish, extending from second median nervule to inner margin; a black lunular mark just beyond cell, and two black lines between first and second median nervules; hind margin broadly bordered with olive-brown, paler inwardly, and with two indistinct silvery spots near anal angle. Hind wings silvery; an irregular black line commencing on costa near base, crossing cell, and turning off sharply towards inner margin on third median nervule; another somewhat similar line beyond, terminating about midway between anal angle and base; space between these two lines above costal nervure olive-brown; lower portion of cell filled in with olive-brown; a black mark at end of cell. Beyond silvery basal area an irregular olive-brown band crosses the wings, within this band four dark reddish lunules, inwardly edged with silvery blue and black, outwardly bordered with black; the first of these lunules is just below costal nervure, the second and third respectively between first and second and second and third median nervules. Below upper red lunule a large silvery spot centered with olive-brown, and bordered inwardly with black; a black spot below, and again below this a black streak with a minute silvery blue spot at its inner end; close to hind margin a series of seven dull orange markings, bordered inwardly with first a black line, then a silvery lunule; hind margin olive-brown; a silvery blue streak along upper tail. Exp. $2\frac{1}{2}$ in.

Hab. New Caledonia?. In Coll. H. J. Adams.

Mr. Adams has just received a single specimen of this very distinct new *Charaxes*. It came from Mr. Watkins, of Eastbourne, who obtained it in a mixed collection, and could not be positive as to locality, though he believed it to have come from New Caledonia.* This species has no very near ally in the genus; its place appears to be next *C. epigenes*, Godm. and Salv.; it, however, differs from this species in its falcate fore wings, which resemble in shape those of *C. pyrrhus*, Linn. Besides the shape of the fore wings, it may be distinguished from *C. epigenes* by the yellow band of the hind wings. From *C. caphontis*, Hew., an allied species, it may be distinguished by the absence of the red discal markings of the hind wings.

Lynton Villa, Sydney Road, Enfield: Aug. 15th, 1898.

* Mr. Watkins has since written me that he has confirmed New Caledonia as the locality for this *Charaxes*.

THE FEMALE OF *CHARAXES FERVENS*, BUTL.

BY PERCY I. LATHY.

Very closely allied to *C. harpax*, Feld. The yellowish white bands of both wings wider, that of the fore wings extending nearly to anal angle, and of the hind wings terminating on second median nervule. The markings of the under side more distinct.

Hab. Nias. In Coll. H. J. Adams.

Dr. Butler, in his "Account of the Butterflies of the Genus *Charaxes* in the Collection of the British Museum" ('Journal' of the Linnean Society (Zoology), vol. xxv. No. 163, p. 396), describes a male of this species, and places it between *C. mars*, Stgr., and *C. affinis*, Butl. Now that the female is known, its position must be altered, its place being in front of *C. harpax*, Feld.

Lynton Villa, Sydney Road, Enfield: Aug. 15th, 1898.

HETEROCERA OCCURRING IN BRITAIN AND JAPAN.

BY RICHARD SOUTH.

SPHINGES.

SPHINGIDÆ.

ACHERONTIA ATROPOS, Linn.—Is represented in Japan by a form described by Dr. Butler as *medusa*, in which the abdominal bands and stripes are narrower.

SPHINX CONVULVULI, Linn. (= *orientalis*, Butl.).

S. PINASTRI, Linn.—Japanese specimens are mostly referable to the dark form *caligineus*, Butl.

S. LIGUSTRI, Linn. (= *constricta*, Butl.).

DEILEPHILA GALII, Schiff.

CHEROCAMPA ELPENOR, Linn.—Three slight aberrations of this species have been named respectively *macromera*, *fraterna*, and *lewisii* by Dr. Butler.

SMERINTHUS OCELLATUS, Linn. (= *planus*, Walk. = *argus*, Mén.).

S. TILÆ, Linn.—Represented in Japan by *S. christophi*, Staud.

MACROGLOSSA STELLATARUM, Linn.—Common.

Macroglossa (*Hemaris*) *fuciformis* and *bombyliiformis* are represented in Japan by very closely-allied species.

SESIIDÆ.

Trochilium, *Sciapteron*, and *Sesia* are each represented, but by East Asian species only; and the same remark applies to the genera *Ino* and *Zygæna* in the Zygænidæ.

BOMBYCES.

NYCTEOLIDÆ.

SAROTHRIPUS UNDULANUS, Hübn.—The examples of this species in Mr. Leech's collection are of the ashy-grey form *russiana*, Dup.

EARIAS CHLORANA, Linn.—Is represented in Japan by *E. pudica*, Staud., which has fringes of fore wings reddish-brown, and the basal half of costal area is sometimes tinged with pinkish.

HYLOPHILA PRASINANA, Linn.—A form of this species, with costa and inner margin of fore wings yellow and with red-spotted fringes, has been named *sylpha* by Dr. Butler. Examples of this form occur in Europe as well as in Japan; the typical form is found in the latter country also.

NOLIDÆ.

NOLA CONFUSALIS, H.-S.

N. ALBULALIS, Hübn.

N. CENTONALIS, Hübn.—Most of the Japanese examples of this species are pale, and have ochreous-brown lines.

LITHOSIIDÆ.

NUDARIA MUNDANA, Linn.

SETINA IRRORELLA, Clerck.—Is replaced in Japan by *S. flava*, Brem. and Grey.

CALLIGENIA (= *MILTOCHRISTA*) *MINIATA*, Forst. = *rosaria*, Butl.).

LITHOSIA MUSCERDA, Hufn.

L. GRISEOLA, Hübn. (= *adaucta*, Butl. = *ægrota*, Butl.).

L. DEPLANA, Esp. (= *pavescens*, Butl. = *lævis*, Butl.).

GNOPHRIA (= *ÆONISTIS*) *QUADRA*, Linn. (= *dives*, Butl.).

EUCHELIDÆ.

DEIOPEIA PULCHELLA, Linn.—Does not appear to be common in Japan.

CHELONIIDÆ.

NEMEOPHILA PLANTAGINIS, Linn. (= *macromera*, Butl.).—A modification of the form *hospita* occurring in Japan has been named *leucomera* by Dr. Butler; whilst the European var. *matronalis* is represented by var. *melanomera*, Butl.

ARCTIA CAIA, Linn. (= *phæosoma*, Butl.).—Variable; but so far none of the more striking aberrations seen in British collections have been recorded from Japan.

SPILOSOMA FULIGINOSA, Linn.

S. MENTHASTRI, Fabr. (= *punctarium*, Cram.).—"Varies greatly in size and number of spots on the wings; also in colour of body, which ranges from pale yellow to vermillion. Further, the ground colour of primaries and thorax is buff instead of the normal white, agreeing in this respect with examples from the North of England."—(Leech.)

S. LUBRICIPEDA, Esp.—Is represented by *seriatopunctata*, Motsch.

HEPIALIDÆ.

HEPIALUS HECTUS, Linn.

COSSIDÆ.

COSSUS LIGNIPERDA, Fabr.—Is represented in Japan by *C. vicarius*, Walk.

ZEUZERA PYRINA, Linn. (= *æsculi*, Linn.).

LIPARIDÆ.

PORTHESIA CHRYSORRHŒA, Linn.

P. AURIFLUA, Fabr.—The Japanese males are more spotted than British examples of the same sex.

LEUCOMA (= STILPNOTIA) SALICIS, Linn.—Japanese specimens are rather more densely scaled than those from Europe.

LOELIA CŒNOSA, Hübn. (= *sangaica*, Moore).—Japanese specimens are rather darker coloured than European examples.

OCNERIA (= PORTHETRIA = LYMANTRIA) DISPAR, Linn. (= *japonica*, Motsch.).—Mr. Leech says:—"Except that they are somewhat larger, male examples of *L. japonica*, Motsch., and *hadina*, Butl., are not separable from European males of *L. dispar* in my possession; whilst between *umbrosa*, Butl., and other males of *L. dispar* from Europe, also in my collection, there is not even a difference of size; consequently I cannot regard these insects as anything but forms of *L. dispar*." The specimens from Japan range in expanse from 37–71 millim., male; and from 48–114, female.

PSILURA (= LYMANTRIA) MONACHA, Linn.

DASYCHIRA PUDIBUNDA, Linn. (= *pryeri*, Butl.).—Japanese examples are rather different to European specimens, and are referable to *pryeri*, Butl., with which *pudica*, Staud., appears to be identical.

ORGYIA GONOSTIGMA, Fabr. (= *approximans*, Butl.).—Appears to be a local species in Japan.

BOMBYCIDÆ.

BOMBYX NEUSTRIA, Linn.—Variable as in England.

ODONESTIS POTATORIA, Linn.—This species occurs in the typical form in Japan, where there are also modifications leading up to the extreme form *albomaculata*, Brem.

LASIOCAMPA (= GASTROPACHA) QUERCIFOLIA, Linn.—The Japanese specimens most nearly approach the form *alnifolia*, Ochs.

L. ILICIFOLIA, Linn.—The Japanese form (var. *japonica*, Leech) is pale reddish-brown, with well-defined white markings, which are tinged with violet.

DICRANURIDÆ.

DICRANURA (= CERURA) FURCULA, Linn.

D. BIFIDA, Hübn.—Represented in Japan by *D. (C.) lanigera*, Butl.

D. VINULA, Linn. (= *felinia*, Butl.).

STAUROPOUS FAGI, Linn. (= *persimilis*, Butl.).

NOTODONTIDÆ.

PTILOPHORA PLUMIGERA, Esp.

PTEROSTOMA PALPINA, Linn.—Japanese specimens are larger than British.

LOPHOPTERYX CAMELINA, Linn.

NOTODONTA BICOLOR, Schiff.

N. CHAONIA, Hübn.

N. TRIMACULA, Esp.

PYGÆRIDÆ.

CLOSTERA ANACHORETA, Fabr.

CYMATOPHORIDÆ.

GNOPHORA DERASA, Linn. (= *derasoides*, Butl.).

THYATIRA BATIS, Treit.

CYMATOPHORA DUPLARIS, Linn.

Note.—*Heterogenea uncula*, Staud., described from Amurland, is found in Japan; and *Pœcilocampa subpurpurea*, Butl., seems confined to Japan. There are seven species of Saturniidae in the islands; but, with the exception of *Aglaia tau*, Linn., all are East Asian species. Of the genus *Phalera* Japan has four species, one of which, *P. fuscescens*, Butl., represents *P. bucephala*, L., but it has dark hind wings, and a larger apical spot or patch. There are six species of *Drepana*; but only one of these is European, i. e., *D. curvulata*, Bork., which does not occur in Britain.

Emydia. *Euchelia*. *Callimorpha*, *Trichiura*, *Eriogaster*, *Endromis*, *Saturnia*, *Cilix*, and *Glyphisia* seem to be unrepresented in Japan.

NOCTUÆ.

BRYOPHILIDÆ.

BRYOPHILA ALGÆ, Fabr.

BOMBYCOIDÆ.

MOMA (= *DIPHTHERA*) *ORION*, Esp.

ACRONYCTA TRIDENS, Schiff. (= *incretæ*, Butl.). — Some Japanese specimens are 50 millim. in expanse.

A. PSI, Linn.

A. LEPORINA, Linn.

A. STRIGOSA, Fabr.

A. ALNI, Linn.

A. LIGUSTRI, Fabr.

A. RUMICIS, Linn.—Most of the Japanese specimens are dark coloured.

A. AURICOMA, Fabr.—Represented in Japan by *A. pruinosa*, Guen.

LEUCANIIDÆ.

LEUCANIA (*MYTHIMNA*) *TURCA*, Linn.

L. CONIGERA, Fabr.

L. UNIPUNCTA, Haw. (= *extranea*, Guen.).

L. IMPURA, Hübn.

NONAGRIA SPARGANII, Esp.

APAMEIDÆ.

GORTYNA (= *OCHRIA*) *OCHRACEA*, Hübn. (= *flavago*, Esp.).—Japanese specimens differ from British examples in having dark hind wings. Dr. Butler has named this form *Ochria fortis*.

HYDRÆCIA NICTITANS, Bork.—As variable in Japan as in Britain.

H. PETASITIS, Dbl. (? = *immanis*, Guen.).

AXYLIA PUTRIS, Linn.

XYLOPHASIA SCOLOPACINA, Esp.

DIPHTERYGIA SCABRIUSCULA, Linn. (= *pinastri*, Linn.).—Japanese specimens are very dark.

CLOANTHA POLYODON, Clerck. (= *perspicillaris*, Linn. = *intermedia*, Brøn.).

LAPHYGMA EXIGUA, Hübn.

MAMESTRA BRASSICÆ, Linn.

M. PERSICARÆ, Linn.—The type and var. *unicolor*, Staud., are both found in Japan.

APAMEA BASILINEA, Fabr.

A. GEMINA, Hübn.

A. (HELOTROPHA) LEUCOSTIGMA, Hübn. (= *Cerastis lævis*, Butl.).

MIANA.—Eastern Asian species only, and two of these seem to be confined to Japan.

CARADRINIDÆ.

CARADRINA MORPHEUS, Hufn.

NOCTUIDÆ.

AGROTIS SUFFUSA, Hübn.

A. SEGETUM, Schiff. (= *ingrata*, Butl.).

A. OBSCURA, Brahm. (= *ravida*, Hübn. = *valida*, Walk. = *caliginea*, Butl.).—Rather more variable in Japan than in Europe.

A. (HAPALIA) PRÆCOX, Linn.

NOCTUA (OCHROPLEURA) PLECTA, Linn.

N. AUGUR, Fabr.

N. (GRAPHIPHORA) C-NIGRUM, Linn.

N. DITRAPEZIUM, Bork.

N. TRIANGULUM, Hufn.—Represented in Japan by a large form which Dr. Butler has named *plumbata*.

N. BRUNNEA, Fabr.

N. FESTIVA, Hübn. — Replaced in Japan by *N. descripta*, Brem.

N. DAHLII, Hübn. (= *canescens*, Butl.).—Rather more variable, both in size and colour, than in Europe.

N. BAIA, Fabr. (= *tabida*, Butl.).

AMPHIPYRIDÆ.

AMPHIPYRA PYRAMIDEA, Linn. (= *monolitha*, Guen. = *magna*, Walk.).—Japanese specimens vary in size and marking, but some are quite typical. The European species *A. perflua*, Fabr., and *A. livida*, Fabr., occur in Japan.

ORTHOSIIDÆ.

PANOLIS PINIPERDA, Panz.

TENIOCAMPA (SEMIOPHORA) GOTHICA, Linn.—Japanese specimens are not quite identical with typical *gothica*, and a modification of the *gothicina* form occurs.

T. INCERTA, Hufn. (= *instabilis*, Esp. = *evanida*, Butl.).—The Japanese specimens are generally larger than British examples.

T. STABILIS, View.

T. GRACILIS, Fabr. (= *ella*, Butl.).—Pale and dark forms occur in Japan.

T. MUNDA, Esp.—Japanese specimens are usually larger than European examples. The var. *immaculata*, Staud., is also represented.

ORTHOSIA SUSPECTA, Hübn.

CERASTIS VACCINII, Linn. (= *Dasyampa ardescens*, Butl.).—The form named by Dr. Butler is of the typical character, but it is larger in size, as also are specimens agreeing in marking with var. *mixta*, Staud.

DASYCAMPA RUBIGINEA, Fabr. (= *fornax*, Butl.).—Typical examples occur in Japan, as well as a large form which Dr. Butler has named *fornax*.

OPORINA CROCEAGO, Fabr. (= *sericea*, Butl.).

XANTHIA FULVAGO, Linn. (= *cerago*, Fabr.).

X. FLAVAGO, Fabr. (= *silago*, Hübn.).

COSMIIDÆ.

TETHEA (IPIMORPHA) RETUSA, Linn. (= *Cosmia curvata*, Butl.).

CALYMNIA TRAPEZINA, Linn. (= *Mesogona exigua*, Butl.).

C. PYRALINA, View.

C. AFFINIS, Linn.

HADENIDÆ.

DIANTHÆCIA COMPTA, Treit.

D. CUCUBALI, Fuessl.

MISELIA OXYACANTHÆ, Linn.—Represented in Japan by *M. extensa*, Butl., which has very elongate wings, but is otherwise similar to *M. oxyacanthæ*.

AGRIOPIS APRILINA, Linn.—Represented by *A. viridis*, Leech.

EUPLEXIA LUCIPARA, Linn.

PHLOGOPHORA METICULOSA, Linn.—Replaced in Japan by *P. beatrix*, Butl.

APLECTA (EUROIS) PRASINA, Fabr. (= *herbida*, Hübn.).

A. (E.) OCCULTA, Linn.

A. (E.) NEBULOSA, Hufn.

A. (MAMESTRA) ADVENA, Fabr.—Represented in Japan by the form *adjuncta*, Staud.

HADENA PORPHYREA, Esp. (= *satura*, Hübn.).

H. (DICHONIA) PROTEA, Bork. (= *intermissa*, Butl.).—Typical specimens, as well as var. *intermissa*, occur in Japan.

H. (TRACHEA) ATRIPLICIS, Linn. (= *gnoma*, Butl.).

XYLINIDÆ.

CALOCAMPA EXOLETA, Linn. (= *fumosa*, Butl.).

XYLINA ORNITHOPUS, Rott. (= *rhizolitha*, Fabr. = *pruinosa*, Butl.).

X. *FURCIFERA*, Hufn. (= *conformis*, Fabr.).—Replaced by
X. "*Agrotis*" *ustulata*, Butl.

CUCULLIA ASTERIS, Schiff.

GONOPTERIDÆ.

GONOPTERA LIBATRIX, Linn.

PLUSIIDÆ.

HABROSTOLA TRIPLASIA, Linn.

PLUSIA CHRYSON, Esp. (= *orichalcea*, Hübn.).

P. CHRYSITIS, Linn. (= *nadeja*, Oberth.).—The form of this species characterised by a broken dark band on the fore wing has been named *nadeja* by M. Oberthür. It is the dominal form in Japan.

P. BRACTEA, Fabr.—Represented in Japan by *P. excelsa*, Kretsch. (= *metabractea*, Butl.).

P. FESTUCÆ, Linn.—Japanese specimens are rather small.

P. GAMMA, Linn.—Replaced in Japan by the closely allied Indian species *P. nigrisigna*, Walk.

P. NI, Hübn.—This species occurs in Japan, but seems to be rare.

HELIOTHIDÆ.

HELIOTHIS ARMIGERA, Hübn.

H. DIPSACEUS, Linn. (= *adaucta*, Butl.).

CHARICLEA UMBRA, Hufn. (= *marginata*, Fabr.).

ACONTIIDÆ.

AGROPHILA TRABEALIS, Scop. (= *sulphuralis*, Linn.).—Varies in Japan.

ACONTIA.—All Eastern Asian species.

ERASTRIIDÆ.

ERASTRIA FASCIANA, Linn. (= *stygia*, Butl.).—A variable species in Japan.

HYDRELIA UNCULA, Clerck.

POAPHILIDÆ.

PHYTOMETRA VIRIDARIA, Clerck. (= *ænea*, Hübn.).

EUCLIDIIDÆ.

EUCLIDIA GLYPHICA, Linn. (= *consors*, Butl.).

CATOCALIDÆ.

CATOCALA NUPTA, Linn.

C. ELECTA, Bork. (= *zalmunna*, Butl.).

TOXOCAMPIDÆ.

TOXOCAMPA.—All Eastern Asian species, with the exception *P. limosa*, Treit., which is European, but does not occur in tain.

HERMINIIDÆ.

RIVULA SERICEALIS, Scop.

ZANCLOGNATHA GRISEALIS, Hübner.

Z. TARSIPENNALIS, Treit.

HERMINIA DERIVALIS, Hübner.

PECHYPOGON BARBALIS, Clerck.

HYPENIDÆ.

MADOPA SALICALIS, Schiff. (= *Amblygoes cinerea*, Butl.).

BOMOLOCHA FONTIS, Thnb. (= *crassalis*, Fabr. = *gilla*, Butl.).

HYPENA ROSTRALIS, Linn.

GEOMETRÆ.

See list in 'Entomologist,' xxx. pp. 244-247, 312-316, and xxxi. pp. 4-9.

The British species of *Rhopalocera* occurring in Japan are referred to in a paper entitled "On the Distribution in Eastern Asia of certain Species of *Lepidoptera* occurring in Britain" (*Entom.* xxiv. pp. 81-86).

THE NORTH AMERICAN BEES OF THE GENUS *PROSAPIS*.

By T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

(Concluded from p. 219.)

The following table was prepared to separate the principal forms studied, but it is not suggested that the distinctions are all specific:—

FEMALES.

- | | |
|--|---------------------|
| 1. Face all dark, tubercles all dark, size large . . . | <i>basalis</i> . |
| 2. Face not all dark | 3. |
| 3. Base of abdomen rufous | 4. |
| Base of abdomen concolorous with the rest . . . | 5. |
| 4. Legs fulvous | <i>flammipes</i> . |
| Legs black, tibiæ partly yellow, hind tarsi fulvous | <i>nelumbonis</i> . |
| 5. First abdominal segment distinctly punctured . . | 6. |
| First abdominal segment not distinctly or not at all punctured | 8. |

6. Scutellum, and a broad band down middle of clypeus, yellow *mexicana, vigilans, trepanda*.
Scutellum not at all yellow 7.
7. Lateral face-marks shaped like feet on tiptoe *asinina*.
Lateral face-marks very narrow, not like feet
Sp. from Tuerto Mt., N. M.
Lateral face-marks triangular Sp. from Texas.
8. Small species, with the punctuation of the pleura sparse and shallow 8a.
Mostly larger species, face-marks triangular or bow-shaped, pleura coarsely punctured 9.
- 8a. Clypeus with a light spot, face-marks subtriangular, tegulæ with a yellow spot *mesilla*.
Clypeus all dark, face-marks bow-shaped, tegulæ all dark, collar dark *pygmæa*, S. Dakota.
Clypeus all dark, face-marks narrowly triangular, tegulæ with a yellow spot, collar dark *pygmæa*, var., Colorado.
(There may be a little spot on clypeus of *pygmæa*.)
9. Lateral face-marks triangular 10.
Lateral face-marks elongate or bow-shaped 12.
10. Lateral face-marks curved inward at the apex, tegulæ all dark (rarely with a spot) *modesta*.
Similar, but much more sparsely punctured *sparsa*.
Similar, but thorax much more coarsely punctured, wings darkened *confluens*.
Lateral face-marks terminating in a point on orbital margin 11.
11. Somewhat larger, tegulæ without a yellow spot 11a.
Somewhat smaller, tegulæ with a yellow spot 11b.
- 11a. Face-marks pure white Sp. from Texas.
Face-marks deep yellow 11c.
- 11c. Wings hyaline, 2nd submarginal cell longer *wootoni* (presumably).
Wings subfuliginous, 2nd submarginal cell shorter.
(The 2nd submarginal varies, however; the tegulæ may have a small yellow spot) Sp. from Georgia.
- 11b. Clypeus all dark *zizia*.
Clypeus with a very broad pale band, or conical mark 11d.
- 11d. Thorax closely and finely punctured, scutellum closely punctured, wings pale fuliginous, band on clypeus Sp. from California (*bakeri* ?).
Thorax coarsely and deeply punctured, scutellum sparsely punctured, wings hyaline, conical mark on clypeus *azteca*.
12. Wings fuliginous, no spot on tegulæ *schwarzii*.
Wings hyaline, no spot on tegulæ (rarely a small spot) 12a,
Similar, but much smaller Sp. from Georgia.
Wings hyaline, a spot on tegulæ 12b.
Similar, wings fusco-hyaline, markings cream-colour *limbifrons*. (Cuba.)

- 12a. Collar all dark 12c.
 Collar partly light Sp. from Colo.
 (and apparently the same from N. H. and Md.)
- 12c. Basal one-third of hind tibiæ light . . . Sp. from N. H.
 Basal one-fourth of hind tibiæ light . . . Sp. from Calif. and Vanc. I.
- 12b. Collar all dark (excl. tubercles) 12d.
 Collar partly light 12e.
- 12d. Markings yellow, clypeus all dark *varifrons*.
 Markings whitish, clypeus with a transverse white
 band Sp. from Colorado.
- 12e. Head longer, markings whitish Sp. from Colorado.
 Head shorter, markings yellow Sp. from N. H.
 Head shorter, markings whitish, lower half of
 clypeus rufescent Sp. from Nevada.
 Light band on lower edge of clypeus . . . *elliptica*. (Canada.)

It may be useful, in conclusion, to give a list of the species known from America north of the Isthmus of Panama. Full bibliographical references will be found to those of Smith and Cresson in Dalla Torre's recent catalogue of bees; for the species of Robertson and the present writer see the most recent volumes of 'Psyche,' Trans. Am. Ent. Soc., and Canad. Entom.

(1.) Boreal species, extending more or less across the northern part of the continent:—

- | | |
|----------------------------------|------------------------------------|
| <i>P. basalis</i> , Sm., 1853. | <i>P. pygmaea</i> , Cr., 1869. |
| <i>P. varifrons</i> , Cr., 1869. | <i>P. elliptica</i> , Kirby, 1837. |

(2.) Species of the N.E. States, and Canada, W. to the plains:—

- | | |
|---|--|
| <i>P. modesta</i> , Say, 1837. | <i>P. saniculæ</i> , Rob., 1896. (Ill., Ia.) |
| <i>P. ziziæ</i> , Rob., 1896. | <i>P. nelumbonis</i> , Rob., 1890. (Ill.) |
| ? = <i>affinis</i> , Smith, 1853. | <i>P. illinoensis</i> , Rob., 1896. (Ill.) |
| <i>P. pennsylvanica</i> , Ckll., 1896. (Pa., Va.) | <i>P. sparsa</i> , Cress., 1869. (Pa.) |
| <i>P. antennata</i> , Cress., 1869. (N. J., Md.) | <i>P. verticalis</i> , Cress., 1869. (Mass., Pa., Conn.) |

(3.) Species of the Atlantic seaboard, Fla. to N. J.:—

- P. confluens*, Sm., 1853.

(4.) Species of the Southern States, W. to the plains:—

- | | |
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| <i>P. schwarzi</i> , Ckll., 1896. (Fla.) | <i>P. georgica</i> , Ckll., 1896. (Ga.) |
| <i>P. flammipes</i> , Rob., 1893. (Fla.) | <i>P. triangularis</i> , Ckll., 1896. (Ga.) |
| <i>P. floridana</i> , Rob., 1893. | <i>P. labiatifrons</i> , Ckll., 1896. (Ga.) |

(5.) Species of S. Dakota, approaching the Rocky Mts. types:—

- P. ziziæ*, race *dunningi*, Ckll., nov.

(6.) Species found west of the plains:—

- | | |
|---------------------------------------|---|
| <i>P. mesillæ</i> , Ckll., 1896. | <i>P. bakeri</i> , Ckll., 1896. |
| syn. <i>subtilis</i> , Fox MS., Ckll. | <i>P. citrinifrons</i> , Ckll., 1896. |
| (preocc.) | <i>P. rugosula</i> , Ckll., 1896. (Colo.) |

- **D. vastator*, Mask. (1)
D. virgatus, Ckll. (2) (syn. *ceriferus*, Newst.)
Ceroplastes rubens, Mask. (4)
Lecanium nigrum, Nietn. (4)
L. nigrum v. *depressum*, Targ. (7)
L. hesperidum, L. (7)
L. oleæ, Bern. (7)
L. acuminatum, Sign. (7)
L. longulum, Dougl. (1)
**Pulvinaria mammaria*, Mask. (1)
P. psidii, Mask. (7)
Aspidistus aurantii, Mask. (1)
A. longispina, Morg. (1)
A. hederæ, Vall. v. *nerii*, Bouché (1)
Mytilaspis gloverii, Pack. (4)
**M. hawaiiensis*, Mask. (1) (as var. of *flava*)
M. pomorum, Bouché (1)
M. pallida, Green, v. *maskelli*, Ckll. (1)
Howardia biclavis, Comst. v. *detecta*, Mask. (1)
Chionaspis prunicola, Mask. (1)
(syn. of *Diaspis amygdali*, Tryon, fide Cooley, in litt.)
C. eugeniæ, Mask. (2)
Fiorinia fioriniæ, Targ. (4)
Aulacaspis boisduvalii, Sign. (1)
A. rosæ, Bouché (1)

The noticeable thing about this list is that nearly all the species are importations from elsewhere. The *Aspidistus maskelli*, lately described from the Sandwich Islands, has just been found by Dr. Noack in plenty at Campinas, Brazil. So it may soon be with most of the remaining five possibly endemic species, that they will be found to occur elsewhere; in fact, it is not certain that we really know anything about the native Coccidæ of the Sandwich Islands, or, indeed, whether there are any!

The description of a new species follows:—

Aspidistus persearum, n. sp.

♀. Scale suboval, $1\frac{1}{4}$ mm. long, 1 broad; slightly convex, brownish cream-colour; exuviae sublateral, concolorous, inconspicuous. The scale is easily distinguished from that of *A. destructor*, being quite opaque, dull, more coloured, and not so flat.

♀. Of ordinary form, pale lemon yellow. Four groups of circumgenital glands, of six orifices each. Three pairs of lobes, the median ones brown, the others colourless; median lobes close together but not quite touching, parallel, elongate, considerably longer than broad, the sides straight, the rounded ends minutely serrate; second lobes similar in shape but smaller, also serrate at ends, their ends reaching slightly beyond the level of the tips of the median lobes; third lobes small, notched on the outer side. Squames branched and serrate, as in allied forms; there are seven beyond the third lobe. Spines large, but not longer than the squames. Anal orifice small, close to the base of the median lobes.

Hab. Scales gregarious on under side of leaf of avocado pear (*Persea persea* = *P. gratissima*) from Honolulu, 1898. Found by Mr. Alex. Craw in the course of his horticultural quarantine work at San Francisco. The portion of the leaf attacked turns brown beneath, reddish above. *A. persearum* is a species of *Aspidistus*, s. str., allied to *A. destructor*, Sign. It is in no way related to *A. perseæ*, Comst.

Mesilla Park, New Mexico, U.S.A.: August 6th, 1898.

NOTES AND OBSERVATIONS.

EREMOTIA OCHROLEUCA AT SUGAR.—As I do not think this species usually turns up at sugar, it may be worth while recording that I took a specimen here on a sugared elm trunk on Aug. 25th last. Although I distinctly saw it sipping the sugar, it was apparently not quite at its ease, as no sooner did I turn my lantern on it that it fell down among the grass beneath. I succeeded, however, in boxing it, and found it to be in very good condition. I have taken this species for nearly thirty years, but never previously at sugar. My friend Mr. E. A. Fitch informs me that he has taken it at sugar also this year, two specimens. It is a much rarer species in this neighbourhood than it was some few years ago.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Essex, August 30th, 1898.

THE LARVA OF CTENUCHA VENOSA.—On the Experimental Station Farm, Mesilla Park, New Mexico, July 26th, I found a couple of larvæ feeding on the grass. In general appearance they reminded me of those of *Hyphantria*. They were about 19 mm. long, pale ochrey yellow, with moderately long barbed white hairs springing in bundles from colourless tubercles. Subdorsal and lateral pale lemon yellow stripes, narrowly and irregularly edged with pink. Head sordid yellow, shiny. Stigmata brown. Thoracic legs bright yellowish brown. One pupated in some corner of the breeding cage, the other spun a thin cocoon on the inflorescence of the grass. The moths emerged Aug. 5th and 6th, and proved to be *Ctenucha (Phylaros) venosa* (Walk.), which ranges from New Mexico and Texas to Venezuela, according to Neumoegen and Dyar. The species was first identified for me by Dr. Dyar, from specimens found in Fillmore Cañon, Organ Mountains, N.M. The larva has not been described, so far as I can learn.—T. D. A. COCKERELL, Aug. 6th, 1898.

PROTECTIVE RESEMBLANCE.—All those collectors of Lepidoptera who have been able to work much in the field cannot fail to have noticed the beautiful and remarkable protective resemblance which some species bear to their surroundings; and there can be no doubt that they possess an inherited and instinctive knowledge of this assimilation, and select such places as a protection against their *natural* enemies. Man is an *unnatural* and unknown enemy, but even he, unless a keen and practised observer, will fail to notice them even when within a few feet of him, so beautiful is often the protective resemblance. What wonderful instances of this are *Cucullia umbratica* when resting on posts or palings; *Polia chi* on rocks, appearing like a spot of grey lichen; *Acronycta psi* on the trunk of oak or ash; and many others that will be remembered. The following three apparently special instances of this protective resemblance, which have come under my notice during the last few seasons, may be worthy of record. On one occasion when passing across some hill land in Wales, where gorse occurred here and there, some of which had been scorched by burning, and only the stems with some of the foliage singed remained, having in parts a reddish brown appearance,—here I found a specimen, with wings closed, of *Arctia*

fuliginosa; the protective resemblance was remarkable, and quite a chance of one not passing it. Another instance was that of *Gonoptera libatrix* resting on the ground amongst leaves, with the under side uppermost, the beautiful white tips of its feet appearing like a white fungoid growth, as they lightly clasped the leaves. Another instance, which perhaps may be thought doubtful, but which I feel myself almost certain of, is that of the larva of *Charocampa porcellus*. In a glade of a Gloucestershire wood I found on the sides large patches of lady's bedstraw (*Galium*). In one spot a species of vetch was intermingled, the dark seed-pods scattered here and there; noticing from a short way off something rather peculiar, as I thought, in two of them, I found on approaching two larvæ of *C. porcellus* of medium size. The resemblance of the larva, when stretched out, to the seed-pods was quite remarkable, and doubtless might have deceived many a bird. Would it be too much to imagine that the parent moth selected such a spot for the ova foreseeing the chance of protection as above described? For some reason many species do not deposit their ova on the proper food indiscriminately, but frequently appear to select those plants less likely perhaps to be visited by birds.—T. B. JEFFERYS; Bath.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA AT SWANAGE.—*Colias edusa* has been not uncommon at Swanage this year. Three or four were seen on Aug. 20th, and three caught, and another seen on Sept. 2nd.—E. N. HALL; 4, The Avenue, Bridesbury.

COLIAS EDUSA AT CHICHESTER.—*Colias edusa* appeared very sparingly this year in this neighbourhood. The first seen was on Aug. 16th, a male of extraordinarily large size. A noticeable feature of the season has been the remarkable profusion of *Pieris brassicae*; they rose from and flew over the clover fields in all directions, filling the air, their white wings resembling a snowstorm. The gardens have suffered severely in consequence from the depredations of the larvæ, our own not excepted. I have heard of a market-gardener who lost as many as seven thousand plants of broccoli and other kinds of cabbage.—JOSEPH ANDERSON; Chichester.

COLIAS EDUSA IN CORNWALL.—On Sept. 1st I noticed a male specimen of *C. edusa* on the hills overlooking Fowey Harbour near here, and two more on the 13th inst.—ARTHUR RASHLEIGH; Menabilly, Par Station, Cornwall, Sept. 13th, 1898.

COLIAS EDUSA IN EPPING FOREST.—Whilst walking through some fields near Chingford on August 28th, I observed a fine female specimen of this species.—E. C. JOY; 34, Fairholt Road, Stoke Newington, N.

COLIAS EDUSA IN OXFORDSHIRE.—On Sept. 3rd a fine male flew past me at a level crossing on the London and North Western Railway between Bicester and Islip. This is the first I have noted in this district since 1892, when the species was fairly common.—G. C. HUGHES; Chesterton, Bicester, Sept. 16th, 1898.

ACHERONTIA ATROPOS AT CHICHESTER.—I have heard of only one example of this moth, in either stage, in this district during the present season. This was a pupa turned up by our gardener on Aug. 24th whilst digging potatoes. Unfortunately he stuck his prong through the middle of it.—JOSEPH ANDERSON; Chichester.

SPHINX CONVULVULI AT SIDMOUTH.—On Sept. 3rd and 4th I took *Sphinx convolvuli* flying over the tobacco-plants in a garden at Sidmouth, both being perfect specimens.—H. O. WELLS; Hurstfield, The Avenue, Gipsy Hill, London, S.E., Sept. 9th, 1898.

VANESSA ANTIOPA IN KENT.—A fine specimen of *V. antiopa* was captured at East Farleigh, Maidstone, by Mr. Keith Kenward, on Aug. 18th last.—EDWARD GOODWIN; Canon Court, Wateringbury, Kent, Sept. 3rd.

VANESSA ATALANTA ON THE WING AT NIGHT.—A specimen of *Vanessa atalanta* flew into my window after dark on Sept. 17th. It did not seem willing to fly into the darkness of night again, though I tried to make it go. It constantly returned, settling on me or in the room. I do not understand its being abroad at that time of the night.—E. N. HALL; 4, The Avenue, Brondesbury.

NOTODONTA DICTÆOIDES AT CHICHESTER.—A specimen of this moth, in good condition, was found by my brother, Mr. Frederick Anderson, settled on a wall in the garden, on Aug. 17th.—JOSEPH ANDERSON; Chichester.

PHIBALAPTERYX LAPIDATA.—On Sept. 4th last I took a specimen of *P. lapidata* at Badenloch, in Sutherlandshire. It was flying in the hot sunshine.—W. M. CHRISTY; Watergate, Emsworth, Hants.

LARVÆ ON IMPATIENS.—From Sept. 5th to present date (Sept. 14th), I have made careful search over many patches of the wild balsam (*Impatiens noli-me-tangere*) growing near Windermere Lake, but have failed to discover the least trace of *Cidaria reticulata*. The commonest larva lately has been *Euplexia lucipara*, both on balsam and on any species of fern. I found the species equally abundant on Sept. 3rd, in a greenhouse at Morecambe. On Sept. 9th, while examining a patch of *Impatiens* at Lake Side, my attention was drawn to the pallid appearance of one plant, and then to a large piece of frass on a leaf. My thoughts, regardless of date, instinctively flew to *Sphinx convolvuli*; but no: it was a full-fed larva of *Charocampa elpenor* clinging to the stem. I have thought this may be worth note, as *C. elpenor* is not common in the district; it was also very late for the larval stage; and, thirdly, it has not before, I believe, been recorded to feed on *Impatiens noli-me-tangere*.—(Rev.) A. M. MOSS; Kendal.

COLLECTING AT FOLKESTONE.—While staying at Folkestone for a fortnight in July, I managed to take a few very good insects, including *Sesia chrysidiformis* (one only), *S. ichneumoniformis*, *Tapinostola bondii*, *Setina irrorella*, *Bryophila glandifera*, *Acidalia ornata*, a few nice vars. of *B. perla*, *Odontia dentalis* (two); I also found one larva and one pupa of the latter, both of which have since attained the perfect state. Mr. Purdey informed me that this species used to occur in fair numbers, but he had not taken it for years. I also saw one worn *Vanessa cardui*.—W. E. BUTLER; Hayling House, Reading, Sept. 5th, 1898.

COLLECTING IN SOUTH DEVON.—During the first fortnight of September I was staying in South Devonshire, and did some sugaring on the 9th and

10th of that month. Both nights were very favourable, and the insects were without exception in perfect condition, amongst them being a beautiful and evidently freshly emerged specimen of *Laphygma exigua*. I also took *Stilbia anomala* in fair numbers, and odd examples of *Agrotis suffusa*, *A. saucia*, and *Noctua glareosa*. *A. vestigialis* = *valligera* and *Leucania littoralis* were in abundance, and some beautiful varieties of *A. segetum* were taken.—H. W. SHEPHEARD-WALWYN; West Downs, Winchester.

COLLECTING IN SOUTH WALES.—Six miles west of Pembroke is a little village called Castlemartin. A former vicar, the Rev. Clennell Wilkinson, loved insects, and told us something of those in his district; and as the present vicar, the Rev. J. S. Puckridge, is an entomologist too, we may hope to learn more. But as at present the extreme western points of South Wales have hardly been exhaustively worked, a few notes of captures at Castlemartin during my stay there in August may not be unwelcome. The nettles were in danger of disappearing altogether from the ravages of *V. atalanta* and *V. urtica*; the latter were in scores of thousands, but a most careful search failed to produce *V. io*. *V. cardui* were also difficult to find, though on a former visit we secured large numbers. *Bombyx rubi* loved the churchyard, where forty-five were taken in half an hour feeding on the bird's-foot trefoil; as this plant is not obtainable in London during the winter, and they would eat nothing else, they had to be returned. I met a friend who had been successful in breeding over forty imagines from larvæ taken in this district. *Odonestis potatoria* (very small) were abundant. The seed-pods of the campion were being robbed to an extent which seriously threatens the future of that bright little flower; almost every other head was tenanted by a *Dianthæcia* larva. It is not easy to define the species in this stage, but there were certainly more than one. *Eupithecia* larvæ were scarce in the campion-heads. The wormwood (*Artemisia absinthium*) was unusually plentiful, and we were told that *Cucullia absinthii* is often found; but, though I set many young eyes to search, we did not see one. *Dicranura vinula* and *Sphinx ligustri* were plentiful. *D. furcula* was beaten from sallow, with very many interesting geometers, most of which are now pupæ. Our great prize was a magnificent *Acherontia atropos*, just about to become a pupa; but, alas! a merry little kitten found him out, and, being over exuberant in her play, killed him. Of butterflies, there is little to record. *Argynnis paphia* and *A. aglaia* were taken, but not in good condition. *Chrysophanus phlæas* were large and very dark, and *Lycæna astrarche* unusually fine and abundant. I was told *L. ægon* had been plentiful, but I did not see it; neither could *Colias edusa* be found, though ideal cliffs and clover fields abounded. No part of our collecting was more pleasant or successful than "dusking"—to use a quite outrageous word. Geometers abounded; one small corner yielded a very fine and varied series of *Epione apiciaria*. Of the genus *Acidalia*, *imitaria*, *aversata*, *scutulata*, and *bisetata* were common. Of the *Eupithecia*, the best were *minutata* and *coronata*; four of the latter were taken on the wing and one at sugar. *E. decolorata* was very common, and strongly marked; *Emmelesia affinitata* was nearly over. Among the *Cidaria* were *prunata* = *ribesaria*, *silacea*, *testata*, *pyraliata*, the last not common. *Hypsipetes elutata* were strikingly varied; the series taken includes specimens from the lightest green to dark brown, two or three having no markings whatever. Of the thorns, only *Selenia bilunaria* and *Crocallis elinguarua* were taken, and the emeralds were represented by *Pseudoterpna pruinata* = *cytisaria* and *Hemithea strigata* =

thymiaria (?). Among the geometers were also *Melanthia bicolorata* = *rubiginata*, *Eubolia limitata* = *mensuraria*, *E. plumbaria*, *Cabera pusaria*, *C. exanthemaria*, *Lomaspilis marginata*, *Aspilates ochrearia* = *citraria*, *Coremia designata* = *propugnata*, *C. unidentata*, *Larentia didymata*, and many others still more common. The only cuspid found was *Cilix glaucata* = *spinula*, which was fairly plentiful, though I found the larvæ of three others. *Lithosia complanula* was abundant and in perfect condition; *Hepialis humuli* was represented only by females; *H. lupulinus* were generally too damaged to be worth taking. Masses of ragwort grew close down by the sea, and on the flowers *Agrotis vestigialis* = *valligera* was abundant by day. By night the same flowers attracted *A. tritici*, but in one field only. In others *Apamea didyma* = *oculea* abounded in many forms; these are so perplexing that one is not surprised at the five species and thirteen varieties of the great Haworth. Among other common Noctuæ that fell to the net were *Leucania conigera*, *L. lithargyria*, *Caradrina quadripunctata* = *cubicularis*, *Miana fasciuncula*, *M. furuncula*, *Hadena oleracea*, *Hydræcia nictitans*, *Dianthæcia capsicola*, *Xylophasia rurea*, *Tapinostola fulva*, *Noctua umbrosa*. Sugaring was difficult, as there are very few trees; but my wife and I were out most nights, only to be confirmed in our belief that, however perfect our methods may be, the science of sugaring is all but unknown. The average captures were from two to eight or ten specimens a night, generally of the commonest species. But suddenly, on our last night but one, moths swarmed: we might have taken hundreds, including two or three species not seen before. As far as one could tell, the climatic conditions and all others were the same as on many other nights. What wrought so strongly among the moths on this one night? Sugaring is pleasant enough, even when "takes" are few; there are the visits of newts and frogs, and bats and owls, and many less known creatures from all orders of living things, and the chance of seeing how they plan and work and fight for their living; but it would be useful sometimes to know with fair accuracy the nights when captures may and may not be expected. The information at present published is not reliable. I do not know whether anything more reliable is possible, but will not some of the scientific minds among our brotherhood try to give us at least as much help as we have in fixing upon "likely days" for trout? Our sugaring yielded nothing more worthy of mention than *N. dahlii*, *C. blanda*, *L. impura*, and *N. plecta*. — E. GROSE HODGE; Holy Trinity Rectory, Marylebone, Sept. 12th, 1898.

COLLECTING IN SOUTH DEVON.—A fortnight's collecting at Sidmouth in July, with Mr. S. P. Doudney, was very successful, as the weather was perfect, and all the butterflies were in splendid condition. On the cliffs *Hesperia actæon* swarmed at its usual haunts, and *Melanargia galatea* occurred elsewhere; but *Leucophasia sinapis* and *Argynnis aglaia* were scarcer than usual. In Harford Woods *Argynnis paphia* and *A. adippe* were abundant, and *Thecla quercus* could be taken in the lanes. The following moths were taken:—*Sphinx ligustri*, *Leucania lithargyria*, *L. impura*, *L. pallens*, *Heliothis marginatus*, *Geometra popilionaria*, *Metrocampu margaritaria*, *Eubolia palumbaria*, *E. bipunctaria*, and *Cidaria fulvata*. Sugaring only produced *Heliothis marginatus* (one), *Thyatira derasa* (one), *Leucania lithargyria* (one), *Miana furuncula* (five), *Xylophasia monoglyphia* (one), *Apamea oculea* (two), and *Eubolia bipunctaria* (one). Larvæ were scarce, except *Macroglossa stellatarum* and *Melanthia galiata*,

which were very common on the *Galium mollugo* and *verum*; and *Vanessa io* swarmed on the nettles.—H. O. WELLS; Hurstfield, The Avenue, Gipsy Hill, London, S.E., Sept. 19th, 1898.

NOTES OF THE SEASON IN ESSEX.—The season here, on the western border of the county, has been specially marked by two features, the failure of sugar and the attractiveness of light; while to myself it was noteworthy for the number of species taken which I had not seen here before. Between April and September I obtained as many as fifty species which I did not previously know to occur. It is also probable that in the brief notes of captures which follow some peculiar dates may be observed. Roughly speaking, from the beginning of the year up to June 17th arctic weather and north-east gales prevailed, a state of things which made any attempt at collecting a mere farce. Not a moth of any kind, except a single *Herminia tarsipennalis*, came to sugar until Aug. 8th, when there was one moth; on the 10th there were five, on the 16th about a dozen, and after that date they were abundant. I may note here, as of a piece with the other eccentricities of the season, that the two best nights at sugar in point of numbers were marked by a cold east wind and bright moon. In March *Anticlea badiata*, and in May *A. derivata* were fairly plentiful, but there being no sallows here to speak of, I saw nothing else. On May 26th there was a specimen of *Eupithecia coronata* sitting on a tree, and later on some of the second brood appeared. Nothing else worth noting happened till the second and third weeks of June, when there appeared all together *Cidaria corylata* and *C. russata*, *Emmelesia affinitata* and *E. decolorata*, *Ephyra omicronaria*, *Eupisteria heparata*, and *Asthena candidata*, with a single specimen of *Neuria saponariae*. Really warm weather set in on June 27th, when two or three *Anticlea rubidata* were taken; *Bradyepetes* (*Timandra*) *amatara* was excessively abundant in ditches, accompanied by *Melanippe rivata* and *M. unangulata*, both rather scarce, while higher up the hedge *Asthena luteata* was skipping madly along, and *Ligdia adustata* was plentiful. On July 7th *Scotosia vetulata* began to be in great profusion about one spot in a hedge where I could see no buckthorn anywhere near. It was an ordinary whitethorn hedge with willow bushes and oak trees overhanging. The *vetulata* seemed to devote themselves entirely to the whitethorn. Nearly a month later a single *S. rhamnata* flew out of a holly hedge in my garden, where I know there is no buckthorn within half a mile. It was in fine condition too. The lovely little *Pyrallis costalis* appeared on July 8th, and, together with *P. glaucinalis*, must have had a succession of broods, since fine specimens of both continued to turn up at sugar and light until September. On July 18th *Acidalia imitatoria* began to appear, and was very common, and so was *Ebulea crocealis* round the fleabane. *Pyrausta purpuralis* came freely to light, but I could never see it in the daytime. *Endotricha flammealis* came to light on July 27th, and *Eupithecia centaureata* began to come very freely to light on Aug. 13th. A fine specimen of *Pterostoma palpina* turned up in the trap on Aug. 16th, I having previously secured one at Wicken on June 22nd. With the attractions of sugar beginning to be felt, I now was able to do something with Noctuae. *Noctua xanthographa*, of the form *cohesa*, which is almost the only form of it we get here, was first visible on Aug. 17th, *Catocala nupta* on the 18th, a second brood (I suppose) of *Ligdia adustata* the same evening, *Cosmia diffinis*, *Luperina cespitis*, *Paraponyx stratiotata*, *Ennomos fuscantaria* on the 22nd, *Triphana interjecta* on the 23rd, *Agrotis puta* on the 24th, and

on Aug. 25th came the first appearance of *Mamestra anceps*. The list may fitly be closed with the capture of a fine specimen of *Triphæna fimbria*, the first seen, on Sept. 2nd. Of the special Essex insects, *Clisiocampa castrensis* and *Phorodesma smaragdaria*, I cannot speak, as I live far from their haunts, and have not been able to visit them; but from what I have heard, I fear that much of the ground has been practically destroyed by the disastrous floods of last winter. I did once go to a spot where the food-plant of *P. smaragdaria* was growing nicely, but there was not a sign of a larva. The following is a list of the captures at light:—*Mania typica*, *Caradrina alsines*, *Plusia chrysitis*, *Rusina tenebrosa*, *Leucania pallens*, *Miana arcuosa*, *Cerigo cytherea*, *Hydræcia nictitans*, *Noctua umbrosa*, *Luperina cespitis*, *Hadena oleracea*, *Triphæna ianthina*, *Lithosia lurideola*, *Lophopteryx camolina*, *Pterostoma palpina*, *Odonestis potatoaria*, *Cilix spinula*, *Hepialus sylvinus*, *Acidalia imitaria*, *A. aversata*, *A. emarginata*, *Epione apiciaria*, *Eubolia plumbaria*, *Cidaria pyraliata*, *Lomaspilis marginata*, *Selenia bilunaria*, *Melanthia albicollata*, *Cabera pusaria*, *Eupithecia centaureata*, *E. coronata*, *E. castigata*, *E. albipunctata*, *Crocallis elinguaris*, *Ephyra omicronaria*, *Emmelesia unifasciata*, *Hemithea thymiaris*, *Mela nippe rivata*, *Anticlea badiata*, *Ligdia adustata*, *Ebuleu sambucalis*, *Pyralis costalis*, *P. glaucinalis*, *P. farinalis*, *Botys urticae*, *Pyrausta purpuralis*, *Endotricha flammealis*, *Herbula cespitalis*, *Pionea forficalis*, *Aglossa pinguinis*, *A. cuprealis*, *Scopula prunalis*, *Paraponyx stratiotata*, *Cataclysta lemnata*, *Pterophorus rhododactylus*, *Aphonia colonella*.—(Rev.) W. CLAXTON; Navestock, Romford.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—September 8th, 1898.—Mr. J. W. Tutt, F.E.S., President, in the chair. Mr. Little, 17, Belgrave Street, King's Cross, was elected a member. Mr. F. Clarke exhibited some very admirable photographs of the eggs of Lepidoptera sent to him by the President. They included those of *Erebia embla*, *Chionobas jutta*, *Polyommatus bellargus*, *P. icarus*, *Gonepteryx rhamni* and *Spilosoma menthastris*. Mr. Edwards, specimens of *Abraxas ulmata* vars. from York. It was stated that neither on the present occasion nor when the var. was taken years ago did the ova produce dark imagines like the parents. Mr. West, specimens of *Forficula lesnei* from Box Hill and Reigate, at both of which places it was common. Mr. Lucas, a series of the local grasshopper *Mecastethus grossus*, from the New Forest, where it had this year occurred in some numbers. He kindly presented a pair to the Society's collections. Mr. R. Adkin, a series of *Smerinthus tilia*, and remarked on the variation to be seen in the central band. Mr. Turner, a yellow variety of *Callimorpha dominula*, bred from a Deal larva this year; bred specimens of *Myelois cribrella* from Benfleet, where the larvæ were most abundant; a bred example of *A. grossulariata* from Camberwell, having the space internal to the marginal spots of a brownish tinge, the rest of the wing surfaces were normal; and a series of *Aglaia urticae* bred from larvæ taken at Box Hill and fed up in a greenhouse, having the usually large black blotch on the inner margin of the fore wings either entirely absent or represented by a few black scales. Mr. Moore, a series of well-marked blue females

of *Polyommatus icarus* from Folkestone. Mr. Mansbridge, a series of under sides of the female of *Plebius agon*, selected to show the ordinary range of variation in the species as it occurs in St. Leonards Forest. Mr. Montgomery, an exceedingly fine dark suffused male aberration of *Dryas paphia*, one or two bred from ova. Mr. Ashby, a tiny aberration of *P. corydon* from Riddlesdown, and a female of *P. ægon* from Oxshott showing blue splashes. Mr. Bishop, a beautiful bred series of *Geometra vernaria* from Guildford. During the interval, in which the Society could not meet, the rooms have been renovated and the electric light introduced.—HY. J. TURNER, *Hon. Rep. Sec.*

KENDAL ENTOMOLOGICAL SOCIETY.—September 12th, 1898.—Mr. W. Wilson in the chair. After reading the minutes, a letter was read from the President regretting his absence, and dealing with the proposed work of the Society in compiling records of the local fauna. The meeting was fairly well attended, and two new members were elected. The room has been furnished with new tables, two dozen chairs, and supplied with gas. A hearty vote of thanks was accorded to Dr. Parker for the active interest he had taken in this matter on behalf of the Society. Four gentlemen exhibited, and it was hoped that more of the actively working members would contribute towards this most instructive and interesting portion of the evening's business in future. Mr. Holmes exhibited fine series of *Gonepteryx rhamni* and *Erebia blandina*, and some large specimens of *Spilosoma fuliginosa* (northern type) bred from larvæ. Mr. Littlewood, fine series of *Noctua baia* and *Apamea oculea* (very variable); also black form of *Xylophasia monoglypha* and *Agriopis aprilina*. Mr. T. Smith, *Pieris rapæ* (female) exceptionally small, and *Selenia illunaria* (autumn brood). Mr. Wright, a splendid variety of *Epinephele ianira* (female); ground colour lighter than usual, eye spots small, and a creamy white blotch on fore wing; somewhat similar to a specimen figured by Newman. Mr. Littlewood reported *Mania maura* common on treacle on Sept. 5th, though somewhat worn. Mention was made of the abundance of *Vanessa io* and apparent scarcity of *V. atalanta* in the district this year.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—August 15th, 1898.—Mr. G. T. Bethune-Baker, President, in the chair. Mr. John Lenich, Livingstone Road, Handsworth, was elected a member. Mr. C. J. Wainwright exhibited a series of females of *Volucella inflata* taken on hawthorn bloom in the New Forest last June. Mr. Bradley, a dark specimen of *Cidaria corylata* from Sutton; and a specimen of *Pemphredon*, probably *lugubris*, with a parasite on the disc of each wing. Mr. R. G. B. Chase, *Amphydasis betularia* var. *doubledayaria* from Edgbaston. Mr. Bethune-Baker, referring to the last exhibit and the spread of melanism, said that some years ago the black form of *Gracilaria syringella* was very rare; now it occurred freely in the neighbourhood of his house at Edgbaston; the black form of *Mtana strigilis*, which is now quite common locally, was once rare and quite exceptional. Mr. C. J. Wainwright said that in his experience the black form of the species is the only one occurring locally now. Mr. A. H. Martineau showed *Ammophila hirsuta* from Tenby, South Wales, where it was taken by Mr. Chase. Mr. G. T. Bethune-Baker, two drawers containing *palæarctic* and *tropical* butterflies.—COLBMAN J. WAINWRIGHT, *Hon. Sec.*

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ON THE SPECIFIC DISTINCTNESS OF *CORIXA CARINATA* AND *C. GERMARI*, AND THE RESTORATION OF THE LATTER TO THE LIST OF BRITISH RHYNCHOTA.

By G. W. KIRKALDY.

ONE of the two British species of *Corixa* with a longitudinal central percurrent carina on the pronotum, enumerated by Saunders (Hem. Het. Brit. Isl., 1892, p. 340), is *carinata*, comprehending *carinata*, C. R. Sahlb., *sharpi*, Dougl. and Scott, *intricata*, D. & S., and also (not mentioned by Saunders) *germari*, Fieb., and *variegata*, Wallengr. There are certainly two distinct species amongst these, though the synonymy cannot be positively given until the various types have been re-examined. Some time ago, while reading White's "Notes on *Corixa*" (1873, Ent. Mo. Mag. x. p. 60), I remarked that he there describes the strigil in *C. sharpi* as being composed of "eight broad rows," that of *C. intricata* as having "about sixteen rather narrow and very irregular rows." This I have confirmed by an examination of examples in White's collection (recently presented by Mr. T. M. M'Gregor to the Perth Museum), which were received by him from Mr. Douglas. The only other differences that I can find are in the frontal fovea of the male, and perhaps in the palæ. It is not very easy to adjust the synonymy, as I have not seen any original examples of the other species, and little is to be gathered from most of the descriptions.

Sahlberg's original description of *carinata* (1819, Hist. Notonect., p. 12) applies equally well to either. Fieber's *carinata* is not Sahlberg's species, as is well known, but that described later by Thomson as *cavifrons*, while his *germari* is not separable by the brief description in the Bull. Soc. Nat. Moscou (1848, xxi. 1, p. 531); his later descriptions in Abh. böhm. Ges. Wiss.

(1851 (v.), 7, p. 250), "fovea frontali . . . oculos vix superante," and Europ. Hemipt. (1861, p. 99), "Stirngrube . . . die Augen fast überragend," would apply well enough to *intricata*, were it not that in the latter the frontal fovea *distinctly*, though by very little, extends backwards beyond the apical margin of the eyes. Fieber's figures in the 'Abhandlung' (tab. ii., fig. 26) do not give at all a good idea of the palæ. The same author's description of *cognata* (Eur. Hem., p. 99) applies well enough to *sharpi*, "Stirngrube . . . an das obere Augenende reichend." Puton (1880, Syn. Hém. France, p. 234) considers *germari* (= *variegata* = *intricata*) as only a colour-variety of *carinata* (= *cognata* = *sharpi*). Wallengren, however, in 1894, in his revision, in Swedish, of the Scandinavian *Corixæ* (Ent. Tidskr. xv., pp. 129-164) separates his *variegata* (1854) from *carinata*, giving long descriptions. As it is unnecessary to quote these descriptions in full, I give here merely a translation of the diagnoses (p. 159):—

"(1). Pronotum with not more than 8-9 yellow transverse lines; frons, sterna, and pleura yellow; base of abdomen (ventral aspect) blackish; 'legs' ['benen' = (I think) posterior tibiæ and tarsi] pale yellow.

1. VARIEGATA.

"(2). Pronotum with 10-12 yellow transverse lines; frons darker or paler brown; sterna and pleura black, with pale margins; abdomen brownish, with pale margins; at least the exterior margins of the 'legs' brown.

2. CARINATA."

At the end of the description of the former he adds:—

"Obs. Saunders regards this as identical with the following, from which, however, it may at once be differentiated by the smaller size, smaller number of yellow lines on the pronotum, and shorter pronotal carina, the paler colour underneath, the yellow design of the elytra, which is more extended and more obscurely (*otydligare*) divided into series, and lastly by the form of the anterior tarsi in the male; the extension farther backwards of the frontal fovea* of the latter forms another difference. Douglas, to whom I sent an original example, . . . has pronounced his *C. intricata* identical with our species. It is similar also to Fieber's *germari*, but the latter is larger, the frontal fovea of the male extends scarcely beyond the angle of the eyes, sterna and pleura are blackish," &c.

The pronotal lines in both *intricata* and *sharpi* are much split, especially those in the centre, and it is not easy, if possible indeed, to state exactly how many lines there are; moreover, White's single male of *intricata* has certainly not less than eleven of these lines, and after a careful examination I cannot see any noteworthy difference in this respect between his *sharpi* and *intricata*. Moreover, Fieber (Abhandl., p. 250) states "lineis 9-10 nigris" in the diagnosis of *germari*, and "lineis . . . 8-9

* My rendering of this sentence is very free, but it is the only meaning I can gather from "hvarjämte uppehållsorten synes vara en annan."

... *nigris* " in the description, and the other colour-distinctions, both in his and in Wallengren's writings, do not appear to me important; and I do not think the size would be found to vary very appreciably in a large number of examples.

It seems best therefore to write the synonymy of these two species for the present as follows:—

1 **carinata*, Sahlb., 1819.

*=*cognata*, Fieb., 1861.

=*sharpi*, D. & S., 1869.

=*carinata*(p.), Saund., 1892.

2 **germari*, Fieb., 1851.

*=*variegata*, Wallengr., 1854.

=*intricata*, D. & S., 1869.

=*carinata* (p.), Saund., 1892.

And they may be separated as follows:—

carinata.

♂. Frontal fovea extending almost to the base of the frons; pronotal carina almost entire; strigil subcircular, consisting of eight rather broad, regular rows of striæ.

germari.

♂. Frontal fovea extending but little beyond the apical margins of the eyes; pronotal carina rather shorter than in *carinata*; strigil subtruncate oval, almost twice the size of the same organ in *carinata*, consisting of about sixteen rather narrow, very irregular rows of striæ.

I think also that the palæ in *carinata* are more twisted and rather blunter apically, and that the apex of the anterior tibiæ is rather thicker than in *germari*. Also, in *carinata*, there seems to be a row of about thirty-six "teeth" on each pala (concave side), disposed as follows, starting from the base:—Fifteen or sixteen rather blunt "teeth" somewhat cramped together, then one solitary blunt tooth, then five together, though further from each other than the fifteen or sixteen are from each other, then twelve or thirteen elongate tapering, somewhat curved "teeth" continuing almost to the apex of the pala. In *germari* (that is to say, *intricata*) there appear to be about forty all close together extending over a similar distance, and more uniform in shape. I do not wish, however, to place too much stress upon the accuracy of my observations upon this last character. As regards the females, I cannot yet detect any striking difference. Wallengren writes of *variegata* that in females the anterior tarsi are long, very narrowly and roundly knife-shaped; in *carinata*, "anterior tarsi sickle-shaped." In the males, nevertheless, the differences in the strigil and in the frontal fovea are quite sufficient for the separation of the two species.

* Type to be examined.

ON THE NOMENCLATURE OF THE EUROPEAN SUB- GENERA OF *CORIXA*, GEOFFR. (RHYNCHOTA.)

By G. W. KIRKALDY.

SUBGENERA, although anathematised by entomologists—who, however, almost invariably employ them—are convenient in large genera (for example, *Corixa*, which contains probably not far short of three hundred species, of which more than fifty are European). This is more especially the case when, as in *Corixa*, the subgenera have been erected upon structural grounds, which, were it not that the genus is really, as a whole, homogeneous, would form good excuse for its description.

Flor had, in 1860, separated *coleoptrata*, &c., to form a new genus *Cymatia*, but the first attempt at the establishment of "sections" was made by Thomson (1869, Opusc. Ent. i. p. 27), when *Macrocorisa* (*geoffroyi*, &c.), *Glenocorisa* (*cavifrons*), *Cymatia* (*coleoptrata*, &c.), and an unnamed section (*striata*, &c.), which Thomson presumably intended to be the typical subgenus, were erected. Unfortunately the learned Swedish author did not take into account the fact that the typical subgenus (i. e. that to which the generic name itself is imparted) obviously must be that which contains the type of the genus. The genotype of *Corixa* is *striata* of Geoffroy (= *geoffroyi*, auctt.) and not *striata* of Linnæus, and therefore the subgeneric name "*Corixa*" must be conserved for the section containing *geoffroyi*, a new name being rendered necessary for the subgenus *Corixa*, auctt.*

In 1873 (Ent. Mo. Mag. x. pp. 62, 63) F. B. White erected two new subgenera, *Callicorixa* for *præusta* and its allies, and *Oreinocorixa*, synonymous with *Glenocorisa*. Puton (Syn. Hém. France, 1880, p. 234) incorrectly included *carinata* and *germari* in Thomson's *Glenocorisa*, with the diagnosis of which they do not conform; in fact, they belong, in every character, to *Basileocorixa*, the central longitudinal percurrent carina on the pronotum, which is also a conspicuous feature in *Glenocorisa*, being merely a superficial character, although apparently constant, and of some importance for specific differentiation. Saunders (1892, Hem. Heter. Brit., pp. 340, 341) revived White's lapsed *Oreinocorixa* for *cavifrons*, incorrectly reserving *Glenocorisa* for *carinata*. Lastly, Wallengren (Ent. Tidskr., 1894, pp. 159–161) recognised the identity of *Glenocorisa* with *Oreinocorixa*, correctly placing therein *cavifrons*, but erected an unnecessary (as shown above) new subgenus *Arctocorisa* for *variegata* (*germari*) and *carinata*.

The European subgenera appear to me to be as follows :—

1. *Cymatia*, Flor, 1860, et auctt.; type, *coleoptrata* (Fabr.).

* I have proposed "*Basileocorixa*" (i. e. "dominant. *Corixa*"), type, *striata* (Linn.).

2. *Callicorixa*, F. B. White, 1873, et auctt. (plur. *Callicorisa*); type, *præusta*, Fieb.
3. *Basileocorixa*, n. n., 1898; type, *striata* (Linn.).
 = *Corixa* (*Corisa*), auctt.
 = *Corisa* et *Glenocorisa* (part.), Puton, 1880.
 = *Corixa* et *Glenocorisa*, Saund., 1892.
 = *Corisa* et *Arctocorisa*, Wallengr., 1894.
4. *Glenocorisa*, Thoms., 1869, et pl. auctt.; type, *cavifrons*, Thoms.
 = *Oreinocorixa*, F. B. White, 1873, et Saund., 1892.
5. *Corixa*, Geoffr., 1762 (restr. Kirk., 1898); type, *geoffroyi*, Leach.
 = *Macrocorisa*, Thoms., 1869, et auctt.

COLLECTING IN THE FENS.

BY RUSSELL E. JAMES.

ARRIVING at Soham at 7.3 p.m. on Friday, July 22nd, I found Mr. W. O. Bullman waiting for me with his trap, and we made all haste to Wicken, as the night promised well—still and warm, with very light rain. During the drive, Mr. Bullman told me of the comparatively large numbers of *Hydrilla palustris* which had occurred in June, some forty to fifty specimens in all, and the name, in fact, is in everyone's mouth, any of the villagers with whom I chatted referring to it. It has been quite a local event. Although, of course, I was much too late for this species, I was anxious to be off, and after a good meal (Mrs. Bullman understands entomological appetites) got down to the fen about half-past eight, and found Mr. Baily all ready for me as arranged. He said the season had been only a moderate one except for *H. palustris*, but thought the night promised well: disappointment, however, was in store for me, as, after netting a few things at dusk, a fog got up and utterly ruined treacle and light. Although it cleared off in twenty minutes, it seemed to have done for the moths, nothing flying afterwards.

I was only staying four days, so that the first night a blank was disheartening; but, as it turned out, this was the only fog I had, and light was better afterwards—the Monday, when we stopped down in the fen until day dawned, being a really first-class night,—in fact, the best of the year, according to Baily. Treacle paid more or less each night, both in the fen and in the drove above; and in the fen, bark nailed on to posts (tried this year as an experiment) proved to be far better than the orthodox grass-knots, and much easier to work. This idea should be useful in salt marshes and elsewhere. Everything was very

backward, and the species at light were curiously mixed. In the daytime *Papilio machaon* occurred in every stage,—ova and larvæ of all sizes fairly plentiful, one pupa, and at the same time worn imagines on the wing. *Hyria muricata* was walked up when the sun shone, with *Acidalia immutata* and a few *Herminia cribralis*, but day work was not pursued very ardently, as I was overwhelmed with setting. For a collector who conscientiously keeps up with his setting, a visit to Wicken, with good nights at light and treacle, is really hard work.

At dusk, geometers abounded, especially round the buckthorns, where *Collix sparsata*, *Scotosia rhamnata*, and *S. vetulata* literally swarmed, including a few finely marked females of *S. rhamnata*. The sallows were nearly as crowded with numbers of *Epione apiciaria* and *Cabera exanthemaria*; whilst on the still evenings *Nudaria senex* occurred at very early dusk in hundreds all over the fens, and again much later at light, but the very slightest wind seems to affect it, so weak and flimsy is its flight, and unless circumstances are quite favourable, you scarcely see a specimen. Neither of the three buckthorn feeders ever appeared at light, although *S. rhamnata* twice occurred at treacle. *Hydrelia unca* also flew at dusk, and although it was very late for the species, fully half of the short series obtained were in fine condition.

Of larger things, *Hepialus humuli* was swinging about everywhere, and *Odonestis potatoria* females dashed about over the sedge. Other dusk captures were *Lithosia griseola* and its var. *stramineola*, *Leucania conigera*, *Cænobia rufa*, *Herminia cribralis*, *Plusia chrysitis*, *Acidalia immutata*, *A. emarginata*, *A. scutulata* (in any numbers), *Timandra amataria* (common in the drove), *Hypsipetes elutata* (some pretty forms), and *Cidaria pyraliata*.

By beating the hedgerows in the drove (the only beating I did), I took three lovely *Aventia flexula*, *Acidalia imitaria*, *Scotosia rhamnata*, *S. vetulata* (the best females of these last two were beaten here), *Hemithea thymiaris* (very abundant and fresh), *Triphaena interjecta*, and more *Cidaria pyraliata*.

Treacle was almost monopolised by common species, mostly *Leucanias*; *L. pallens*, *L. impura*, and *L. pudorina* occurred about equally, *L. lithargyria* not quite so common, and *L. conigera* distinctly scarce. Of the last-named only a single specimen occurred in the fen, and the remaining dozen or so in the drove. *L. lithargyria* also largely favoured the drove, and some of the finest specimens were taken on the way home after light, when everything else had gone, bar an occasional dissipated-looking *Xylophasia polyodon*. I have frequently noticed elsewhere that this species is a very late visitor. *Apamea gemina* was common, but worn, and two fine *Agrotis raveda* were boxed (the first specimens of the season), and odd *Cosmia diffinis*, *Acronycta*

aceris, *A. psi*, *A. tridens*, *Hadena psi*, and *Mamestra anceps* occurred from time to time.

Although a fair number of things came to light each night but the first, the red letter night was Monday, the 25th, when nearly all the best things were taken, and common species were very thick. So good was the night that I lengthened my four days' stay to five, in the hope of another like it, but although the Wednesday promised quite as well, a heavy storm of rain about 10.30 spoilt it.

The following were the best species taken, many of them, as will be seen, very much behind their time. *Sphinx ligustri* and *Smerinthus populi* (one each at a neighbouring sheet on the 25th), *Earias chlorana* (three worn specimens), *Nola cucullatella* (a few only), *Nudaria senex* (abundant), *Lithosia griseola*, commonly, and its var. *stramineola*, rarely; *Chelonia caia*, very abundant, including a rather nice pale form; and *Odonestis potatoria*, even commoner, a fine pale yellow male and some intermediate forms being taken. This species turns up directly the lamp has been lit, and by the time *C. caia* comes on its flight seems nearly over.

Lasiocampa quercifolia was scarcely out, only about a couple of dozen specimens occurring during the visit, and *Bombyx neustria* was only just starting. Four very fair *Macrogaster arundinis* turned up on the 25th (males of course), and on the same night four species of Notodontidæ, viz. *Lophopteryx camelina*, *Ptilodontis palpina*, *Notodonta dictæa*, and *N. ziczac*, the latter occurring singly on several nights. *N. dictæa* was netted immediately after two *Cucullia umbratica*, and until examined at home was put down as a third specimen of that species, as flying round the lamp they looked very similar.

A few *Leucoma salicis* turned up each night, and a fine *Cymatophora ocularis* on the 27th, evidently, from its condition, only just out. Among Noctuæ, *Leucania pudorina* took a long lead, and was far commoner than its near neighbours *L. pallens* and *L. impura*, which perhaps slightly outnumbered it at treacle. *Cænobia rufa* occurred in numbers on the last night only, when a nice series was taken of pale, dark grey, and reddish forms. *Nonagria hellmanni* and *Calamia phragmitidis* were not out, neither were the second broods of *Arsilonche venosa* and *Arctia fuliginosa*, but *Cleoceris viminalis* was just coming, and six beauties were taken on the 25th, and another on the 27th; all these were boxed whilst fluttering up and down the lamp panes with some difficulty, owing to the crowds of Crambites. Several belated Noctuas put in an appearance, all very worn, except *N. plecta*; but the Agrotids were absent, except for one or two *A. exclamationis*, which, however, swarmed at treacle. *Herminia cribralis* occurred frequently, and although very worn, were not quite so bad as those taken at dusk and in the daytime.

Among the Geometers, *Epione apiciaria* was obtained in anything like numbers on one night only, the 23rd, although always common at dusk; whilst its sallow companion—*Cabera exanthemaria*—occurred every night. The abundance of *Acidalia immutata* was the feature of the group, however; it was the only species to show up on the first and foggy night, and each night afterwards it occurred in very large numbers, and in the finest possible condition. One individual specimen which had oiled itself in the lamp in a well marked way turned up on three consecutive nights, and each time I thought for the moment that it was *Corycia taminata*, which, on account of its curious oil-marks, it strikingly resembled. *Hyria auroraria* occurred on the 27th (rather an unusual species, surely, at light) and a very fair *Cidaria sagittata*, which is very scarce just now in the fen, on the 25th. *Cidaria testata* came next in point of numbers to *A. immutata*, the specimens striking me as being very large and pale. *Cidaria pyraliata* and *Pelurga comitata* occurred frequently, whilst *E. subumbrata* and *E. valerianata* among the Eupitheciæ, and two belated though very fair *Lobophora sexalisata* complete the list of captures in this group. *Nascia cilialis*, among the Pyrales, was common and in fine condition on the 25th, but scarce other nights.

I borrowed a bicycle on the last morning, meaning to ride to Tuddenham, but the machine being a low one, and being myself unusually endowed with length of limb, I developed such a cramp in the knees by the time I arrived at Fordham, that I gave up the idea, and turned again into Chippenham Fen, where I had already spent one morning. *Bankia argentula*, late as it was, was still plentiful, and for the most part in good condition. I took a very nice series, including two varieties with the bars quite close together. Four *Hydrelia unca* occurred among them, and *Hyria auroraria* was walked up not uncommonly from the reed beds, together with a few *Acidalia immutata*, *Herminia cribralis*, five *Lithosia mesomella*, and two nice *Toxocampa pastinum*. Four *Acidalia emarginata* were beaten from privet near the sides of the dykes, and *Macaria liturata* occurred among the pines at the edge of the fen.

Chippenham Fen is exceedingly pretty, the trees adding a beauty which is wanting at Wicken. I believe the greater part is private and preserved, but if permission could be obtained I am sure it would well repay systematic working, which could easily be done from Fordham.

Larvæ I am afraid I neglected entirely, except for intermittent hunting on the dwarf sallows, which produced some twenty larvæ of *Clostera reclusa* in various stages of growth. I left early on the Thursday morning for Fordham, after a most enjoyable visit; and in conclusion would say that anyone visiting Wicken could not possibly do better than stay with Mr. W. O.

Bullman, if his rooms are vacant, as he thoroughly understands collectors' ways, and makes one exceedingly comfortable in every respect.

3, Mount View Road, Crouch End, N.

NOTES ON LEPIDOPTERA IN 1897.

By CLAUDE A. PYETT.

THE influence of weather upon collecting has been remarkably evidenced during the year, but on the whole it has been fairly productive of insects. There was no winter to speak of, if by winter is understood a continuance of frost and snow; but the weather during the opening months of the year was very unsettled and changeable, and but for an occasional specimen of the Hybernidae collecting was out of the question. May, which ought to be *the* month for the lepidopterist, was showery and cool right up to the third week, and insects were consequently very late in emerging, whilst vegetation was likewise very much retarded. The woods, which with the advent of June are generally with verdure clad, presented a wintry appearance, and the oaks and poplars were only just showing for leaf; whilst May was well on the wane before the hawthorn blossomed. In fact, everything, both in the insect world and plant-life, was a month late. Commencing from July, the summer on the whole has been fine and dry, insects on the wing have been fairly plentiful, and the wet spring is being counterbalanced by a brilliant autumn.

My collecting has been principally confined to the Micros, and the first to come under notice are *Roslerstammia exlebella*, *Gelechia cerealella*, *G. nanella*, and *Lithocolletis tristigella*, the captures of which are interesting, as these species had not previously been recorded for the county, and they are therefore additions to the 'Suffolk List of Lepidoptera,' compiled by the Rev. E. N. Bloomfield, who has kindly assisted me in identifying specimens. All four species were obtained through a careful inspection of walls and wall-ledges in Ipswich, and I rather wonder this mode of collecting is not more often heard of, as my experience has been that it pays even better than palings. An old crumbly wall in an unexposed situation is a favourite haunt of those two pretty species, *Argyresthia brockella* and *A. gædarta*, of which I can always rely on getting a long series in season. I have also found *Æcophora lunaris* to be common and widely distributed in the town, this year boxing some fifty specimens in one afternoon. The list of wall captures also includes *Ephestia kühniella*, *Pædisca bilunana* (two), *Stigmonota regiana* (two), *Batodes angustiorana* (several), *Semasia weberana* (two),

Gelechia leucatella (two), *G. domestica* (common), *Dasycera sulphurella* (several), *Retinia buoliana*, *Hedya ocellana*, *Tortrix forsterana*, *T. ribeana*, *T. heparana*, *Depressaria applanata*, *Prays curtisellus*, *Cnephasia nubilana*, *Dictyopteryx læflingana*, *Lithocolletis faginella*, *L. ulmifoliella*, *Aphomia sociella*, *Eudorea cembra*, *E. frequentella* (common), *Gracillaria syringella* (common), *Grapholitha nævana*, *G. trimaculana*, *Coleophora nigricella*, &c. Visits to the woods at Bentley the latter end of May produced *Herminia barbalis*, *Eudorea ambigualis*, *Plutella cruciferarum*, *Incurvaria mascuella*, *Gracillaria swederella* (plentiful), *Coccyz hyrciniana*, *C. argyran*, *Dicrorampha plumbana*, *Adela viridella* (swarming), *Cnephasia musculana*, *Phlæodes tetraquetra* (several), *Swammerdamia griseocapitella*, *Glyphipteryx fuscoviridella* (several), *Eupécilia maculosana* (abundant), *Nepticula* ? *argentipedella*, *Rozana arcuana*, *Laverna fulvescens*, &c. In Ipswich and surrounding neighbourhood I netted *Nephtopteryx roborella* (at Sproughton), *Carpocapsa splendana*, *Cræsia bergmanniana*, *C. holmiana*, *Hedya dealbana* (common), *Gelechia populella*, and several of the commoner Crambidsæ, *Elachista cygnipenella* and *E. rufocinerea*. *Depressaria liturella* was taken at Leiston, whilst among the frequenters of my house were *Tinea biselliella* (abundant), *T. tapetzella*, *T. ferruginella*, *Aglossa pinguinalis*, *Endrosis fenestrella*, *Ephestia elutella*, *Gelechia domestica*, *Cecophora pseudospretella*, and *Ce. fuscescens*.

To turn to the Macros, my diary records, amongst others, the following:—*Sphinx ligustri*, *Smerinthus tilia*, *Cucullia umbratica*, *Biston hirtaria*, *Hemerophila abruptaria*, *Eupithecia assimilata*, *Hypsipetes impluviata*, *Eugonia fuscantaria*, *E. tiliaria*, *Catocala nupta*, &c., all taken at light in the town; whilst on palings I found *Noctua triangulum*, *Caradrina cubicularis*, *Nola cuculatella*, *Acidalia aversata*, *A. trigeminata*, *Orgyia antiqua*, *Bryophila perla* (common), *Eupithecia castigata*, *E. rectangulata*, *E. sobrinata*, &c. Day collecting at Bentley Wood resulted in the following captures:—*Cilix spinula*, *Ephyra punctaria*, *Venilia maculata* (abundant), *Panagra petrararia*, *Euclidia mi*, *Melanippe hastata*, *M. rivata*, *Fidonia piniaria*; *Arctia mendica* and *Corycia temerata* were also seen.

In July, during my holiday at Stafford, I observed the following species at electric light:—*Pygæra bucephala*, *Amphidasys betularia* var. *doubledayaria*, *Leucania comma*, *Agrotis exclamationis*, *Fidonia piniaria*, *Arctia caia*, *Mamestra persicaria*, *Cidaria dotata*, *Melanippe montanata*, *Abraxas grossulariata*, *Tortrix fosterana*, &c. I also paid a visit to Cannock Chase, where, though unprovided with a net, I was fortunate in being able to secure specimens of *Aspilates strigillaria*, a nice series of *Eupithecia nanata*, *Acidalia inornata*, *Pleurota bicostella*, *Grapholitha germinana*, *Tinea fuscipunctella*, *Gelechia leuculella*, *Sericoris lacuana*, and other commoner species.

Ipswich: September, 1898.

TWO NEW COCCIDÆ FROM LAGOS, W. AFRICA.

By T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

Lecanium strachani, n. sp.

♀. Perfectly flat, very broad; length and breadth each about 5 mm.; anterior margin rounded; hind margin truncate. Light brown, the dorsal surface covered with glassy secretion, which in the middle of the back is more or less broken up into small oval plates. Genital aperture surrounded by cottony matter, which does not project beyond the margin of the scale. Legs and antennæ well-developed, light brown; antennæ 8-segmented, formula 3415(268)7. Marginal spines numerous, 66 μ long. Skin after boiling colourless, with only very minute glands. The following measurements are in μ —

Antennal segments:—(1) 66, (2) 50, (3) 116, (4) 83, (5) 58, (6) 50, (7) 41, (8) 50.

Coxa 215, femur with trochanter 315, tibia 249, tarsus 99.

Egg in body of ♀ 265 \times 166 μ .

♂. Scale glassy, quite ordinary.

Hab. Lagos, on *Anona squamosa*. An interesting and distinct species, collected by Dr. H. Strachan, after whom it is named.

Icerya seychellarum (Westw.), race; *albolutea*, n. race.

♀. On under side of leaf; about 5 mm. long and 4 broad; dark red, resting on a cushion of yellow and white cotton. Dorsum entirely covered with bright yellow cotton. From the sides there radiate thick tufts (about 3 mm. long and nearly 1 broad at base) of cotton, which are white beneath and bright canary yellow above. Apparently no well-formed ovisac, but a lot of loose cottony secretion. Antennæ 11-segmented; the following measurements of the segments are in μ —(2) 99, (3) 99, (4) 66, (5) 50, (6) 83, (7) 83, (8) 83, (9) 83, (10) 99, (11) 157. Width of anterior femur 149 to 199 μ .

Hab. Lagos, on *Anona squamosa*, collected by Dr. H. Strachan.

This is not related to *I. ewarti*, which Newstead described from Lagos, but is closely allied to *I. seychellarum* and *I. crocea*, although it seems not to have the glassy or silky filaments of those species. For the present, it may be treated as a race or subspecies of *seychellarum*. The only material of *I. seychellarum* I have seen is a small quantity in alcohol kindly sent to me by Dr. L. O. Howard; it was collected in Mauritius, and sent to the Department of Agriculture by Mr. D. Morris of Kew. Comparing this with *albolutea*, I find the antennæ almost the same, but segment 3 measures 116 μ , 4 is 83 μ , and there are other such small differences, which may not be constant. The legs of *seychellarum* are darker than those of *albolutea*, with very curved tarsi, and the bristles on the femur and tibia are stronger and longer. The anterior legs of the two forms measure as follows in μ —

	Coxa	Trochanter	Femur	Tibia	Tarsus	Claw
<i>I. albolutea</i>	331	182	516	533	232	66
<i>I. seychellarum</i>	398	265	514	580	265	88

NOTES AND OBSERVATIONS.

LARVÆ OF *SMERINTHUS OCELLATUS* DESTROYED BY WASPS.—Dr. Gardner informs me that the depredations of the wood-wasp deprived him this summer of a large and promising brood of *S. ocellatus*. For long he noticed that the tale of caterpillars was diminishing, and only discovered the cause by accidentally observing one of the wasps engaged in his act of murder and robbery combined. The wasp planted himself on the back of an unfortunate larva, and deliberately cut him in two with his jaws, seizing the capital half, carefully tucking in the head, and flew off with it. Soon after he returned for the caudal half.—HAROLD HODGE; 6, Crown Office Row, Temple.

A NEW HABITAT FOR *L. LYCIDAS*.—There are now a sufficient number of collectors who visit Switzerland every year in pursuit of our sport to make it a matter of interest that I can record the capture of six specimens of the above insect at St. Nicolas on July 18th of this year. I was obliged to leave that same day; but I showed my captures to the Rev. C. Buckmaster, who writes me word that he followed up my path of luck on the following day, and was also successful in taking *L. lycidas*.—(Rev.) F. E. LOWE; St. Stephen's Vicarage, Guernsey.

DICRORAMPHA FLAVIDORSANA, Knaggs.—Through the courtesy of Dr. Knaggs and Mr. C. G. Barrett I have had the opportunity of examining the type of *D. flavidorsana*, together with series of *alpinana*, Staint., and *questionana*, Zell., and also the examples of *D. petiverella*, referred to by Dr. Knaggs in his paper (*ante*, pp. 201–203). All these specimens were subsequently exhibited at a meeting of the Entomological Society of London. Dr. Knaggs has already clearly shown, in the article cited, that the name *flavidorsana* is the prior one for the insect we have long known as *D. alpinana*, Staint., and more recently as *questionana*, Zell. There is no doubt whatever that all three descriptions apply to the same species; and it is equally beyond contention that *flavidorsana* is much earlier than *questionana*. The 'Manual' name cannot stand, as a *D. alpinana* was described by Treitschke in the year 1830; and this is not the same species as that referred to as *alpinana* by Stainton. Some more or less aberrant specimens of *D. petiverella* were at one time doubtfully referred to *D. flavidorsana*, and it is probably due to this fact that the latter is so generally considered to be a variety of the former. In 1881 I captured and bred specimens of *D. flavidorsana* in North Devon, and published a note on the occurrence at the time (*Entom.* xiv. 159). Several of the Microlepidopterists of that date, to whom I showed the specimens, held the opinion that they were *alpinana* of the 'Manual,' and in this view they are now proved to have been correct. At the same time, however, they were in error in maintaining that the insects had nothing to do with *flavidorsana*, which they insisted upon relegating to *D. petiverella* as a form of that species.—RICHARD SOUTH; 100, Ritherdon Road, Upper Tooting, S.W.

THE INSECT FAUNA OF HASTINGS AND ST. LEONARDS.—The Rev. E. N. Bloomfield has published a third 'Supplement' to this local list. A large number of additions are brought forward.

BRITISH DRAGONFLIES.—We note that the subscription price of the work on 'British Dragonflies,' by Mr. W. J. Lucas, to be published by Mr. L. Upcott Gill, of the Strand, London, has been raised to fifteen shillings; and it is intimated that the price will be further increased to a guinea on publication.

LARVÆ OF *TINEA VASTELLA* INFESTING THE HORNS OF THE ANTELOPE.—We referred (*ante*, p. 168) to a letter on this subject, published in 'Nature' for June 9th last. In the number dated September 15th of the same journal the matter is further considered, and from this it would appear that the larva in question does attack the living horns.

THE PRESENT PRICES OF THE OLDER WORKS ON BRITISH ENTOMOLOGY.—As enquiries are frequently being made respecting the above, it has been thought that a few particulars on the subject might perhaps be of more or less general interest. With a view, therefore, of obtaining some idea of the current market value of such books, the catalogues of various Natural History booksellers, both British and foreign, have been consulted; and the results, so far as concerns the works enumerated below, are submitted for the information of those who may be curious in such matters. Other books will be referred to as opportunity offers.

Albin (E). 'Natural History of English Insects.' Illustrated with 100 copper-plates, curiously engraven from the life, and exactly coloured by the author; 100 hand-coloured plates; and 100 leaves of text. Large 4to. Date 1720.—This work is not often found mentioned in catalogues; but occasionally a copy, bound in calf, may be had for about £2 12s. 6d.

Albin (E.) and Derham (G.). 'Insectorum Angliæ Naturalis Historia.' 100 plates. Date 1731.—This is quoted in a foreign catalogue at 15 marks.

* Aurelian, The. Harris (Moses). Date 1778. With forty-four coloured plates.—Not often quoted in catalogues. A "fine copy" was offered in the year 1891 at £4 10s. The third edition (1794), with 46 coloured plates, has been listed at £1 15s.; whilst the Westwood edition, brought out in 1840 at the price of £5 5s., has been marked in catalogues during the past ten years at from £2 to £3 3s.—The late Mr. Stainton, referring to this edition of the 'Aurelian' in 1856, when the work was selling at £4 4s., says:—"The colouring is very gaudy, and little resembles the productions of nature. For babies, both young and old, who like to look at picture-books, it may not be uninteresting; but as a nursery toy it is rather expensive."

Aurelian's 'Pocket Companion,' The. One coloured plate. Date 1775. By the same author as the above.—Present price about 2s.

Curtis (J.). 'Farm Insects: being the Natural History and Economy of the Insects Injurious to the Field Crops of Great Britain and Ireland; and also those which Infest Barns and Granaries.' Sixteen coloured plates (1860).—The above edition is on sale at £1; and a later edition (1883) at 18s. 6d.

Curtis (J.). 'The Genera of British Lepidoptera.' Thirty-five coloured plates (1858).—May be had from 15s. to £1 8s.

- Curtis's 'Illustrations and Descriptions of the Lepidoptera found in Great Britain and Ireland.' 193 coloured plates (1862).—Has been offered at £9 12s. 6d.
- Curtis (J.). 'British Entomology: Illustrations and Descriptions of the Genera of Insects found in Great Britain and Ireland.' 770 coloured plates. Sixteen volumes bound in eight (1862).—The above was published at £28. It is sometimes quoted in catalogues at about £21. The original edition was published 1824–1839, and copies are occasionally offered at from £16 to £20. There is still another edition, with the contents systematically arranged. This is dated 1823–1840; and the present price is £21.
- Donovan (E.). 'Natural History of British Insects.' Ten volumes. Demy 8vo. With 360 coloured plates (1782–1801).—A picked copy, bound half-morocco, is quoted at £3 8s. Another edition, sixteen volumes, large 8vo, date 1802–1813, with nearly 600 coloured plates, is offered in a catalogue for this year at £5 10s. and £6 6s. per copy.
- Duncan (J.). 'Natural History of British Butterflies.' 12mo. Thirty-four coloured plates. Date 1835. Price from 8s. to 6s.—About the same figures seem to rule for the volume on 'Moths' by this author, which was published in 1836.
- 'Entomological Magazine,' The. (Edited by E. Newman.) Five volumes. 8vo. With woodcuts and plates. Date 1832–1838.—Sets of this periodical are now rather scarce, and are quoted at from £2 15s. to £3 10s.
- 'Entomologist's Weekly Intelligencer,' The. (Edited by H. T. Stainton.) The first number was published in 1856; and the last, concluding vol. x., in 1861.—Complete bound sets range in price from £2 2s. to £3 3s.
- 'Entomologist,' The Weekly. (T. Blackburn.) Date 1862–1863.—Does not appear in any catalogue that I have had an opportunity of seeing.
- Harris (Moses). 'An Exposition of English Insects.' Date 1782. A 4to volume. With thirty-one copper-plates, coloured. Sometimes offered at £1; but in a catalogue of this year's date the price is £1 10s. for a nicely-bound copy.—An earlier work (1776), bearing the above title, with eleven coloured plates and a frontispiece, has been several times quoted in the catalogues of a foreign bookseller at 4 marks.
- Haworth. 'Lepidoptera Britannica.' Date 1828. 8vo, calf gilt. Quoted at 6s.—In a German list for 1891, vols. i., ii., and iv. (1803–1828) were offered for 18 marks; and the "Prodrömus" for 2½ marks.
- Humphreys (H. N.). 'Genera of British Moths.' With sixty-two coloured plates (1861). Present price from £1 5s. to £2 2s.—The Genera and Species of British Butterflies,' with thirty-two coloured plates, by the same author (1868), may be obtained at 6s.
- Humphreys (H. N.) and Westwood (J. O.). 'British Butterflies and their Transformations.' Forty-two coloured plates. 4to. (1841).—Quoted at £2 2s. Another edition (1848) is priced at £1 10s.
- Humphreys (H. N.) and Westwood (J. O.). 'British Moths and their Transformations.' Two volumes. With 124 coloured plates. 1845.—This edition is offered at £5 10s.; but the 1849

- edition is £1 10s. less; and that of 1854 is quoted at £4 10s.—The 'Butterflies and Moths,' three volumes, all of the first edition, uniformly bound in russia, are put down at £7 10s.
- Lewin (W.). 'On some Rare British Insects (Lepidoptera).' Date 1807. 4to. With two coloured plates.—Quoted in a German list at 2 marks. A previous edition (1793) has been offered at 1s. 6d.
- Lewin (W.). 'Insects (Lepidoptera) of Great Britain.' Text in English and French. With forty-six coloured plates. 4to. Date 1795.—Copies in good condition and bound in calf are sometimes offered at £1 1s.
- Morris (F. O.). 'History of British Butterflies.' With seventy-one coloured plates. (1860 and 1864 editions).—Ranges in price from 15s. to £1 1s., according to binding. The fifth edition (1870), with seventy-two coloured plates, has been quoted at 7s. 6d. per copy.
- Morris (F. O.). 'History of British Moths.' Parts 1-32. With sixty-four coloured plates. (1859-1863).—The subscription price was £3 3s.; but copies of this edition are now quoted at 18s. Subsequent editions, in four volumes, range from £2 10s. to £4 7s. 6d.
- Samouelle (G.). 'Entomological Cabinet.' (1832-1834).—An incomplete copy is set down in a recent catalogue at 10s.
- Samouelle (G.). 'The Entomologist's Useful Compendium; or an Introduction to the Knowledge of British Insects.' With twelve coloured plates. (1819).—This was published at £1 18s., and is now quoted at from 4s. 6d. to 10s. The edition with plain plates, published at £1, may now be had at from 3s. to 5s.
- Stainton (H. T.). 'Insecta Britannica: Lepidoptera Tineina.' Ten plates. (1854).—Ranges from 18s. to £1 1s., according to binding.
- Stainton (H. T.). 'Manual of British Butterflies and Moths.' Two volumes. (1857-1859). From 6s. 6d. in cloth, to 14s. in calf binding.
- Stainton (H. T.). 'The Natural History of the Tineina.' Thirteen volumes. Eighty coloured plates. Text in English, French, German, and Latin. (1855-1873).—This fine work was published at about £8; in a recent list it is quoted at £5 15s.; but in other catalogues the price is rather higher.
- Stephens (J. F.). 'Illustrations of British Entomology.' Twelve volumes. Royal 8vo. One hundred coloured plates. (1828-1846).—This work was published at £21, and may now be had for £5. Odd volumes are sometimes offered at from 5s. to 10s. each.
- Stephens (J. F.). 'Systematic Catalogue of British Insects.' (1829).—Quoted from 3s. 6d. to 4s. 6d. The original price was £1 7s.
- 'Substitute,' The. (Edited by H. T. Stainton.) Date 1856-1857.—The name of this periodical does not often occur in catalogues. It was quoted last year at 4s. 6d.
- Westwood (J. O.). 'Introduction to the Modern Classification of Insects. Two volumes. Coloured plates. (1839-1840). The present price ranges from £1 11s. 6d. to £2 2s., according to quality of binding.
- Wilkinson. 'British Tortrices.' (1859).—Quoted in a catalogue of this year's date at 10s. 6d.; but in a German list of 1891 it stood at 26 marks.
- Wilkes (B.). 'One hundred and twenty Copper-plates of English Moths and Butterflies: representing their Changes into the Cater-

pillar, Chrysalis, and Fly states; and the Plants, Flowers, and Fruits whereon they Feed; with a Natural History of the Moths and Butterflies; describing the Method of Managing, Preserving, and Feeding them. 4to, cloth. 1773.—The above was published at £9 9s., and may now be had occasionally at £2 10s. or £3.

Wood's 'Index.' Large paper edition. 1839.—From £3 3s. to £5 5s., according to condition and colouring. In a German list, of about two years ago, a copy was offered at 30 marks.

The Westwood edition of the above (1854) is quoted at from £2 10s. to £3 10s.; while the Westwood 'Supplement' may sometimes be obtained separately at about 10s.

R. S.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA IN NORTH-WEST LONDON.—On Aug. 20th, as I was on my way to the Zoological Gardens, I saw a male *C. edusa* near Regent's Park. The day was a warm one, and the specimen was evidently freshly hatched and was flying strongly, but I did not attempt to catch it, as it looked so lovely in the sunshine, and I have a good series. Is this butterfly often seen in London? The species was common at Devonport in 1892, but scarce there in 1893 and 1894.—F. D. WELCH; 8, Brandram Road, Lee, S.E.

COLIAS EDUSA IN KENT.—I took a male specimen in fine condition on the sands near Sandwich, on Aug. 20th.—W. G. LUCAS; Kingston-on-Thames.

COLIAS EDUSA IN SUFFOLK.—A male specimen of *C. edusa* was caught here on Sept. 10th.—EDWARD RANSOM; Sudbury, Suffolk, Oct. 4th, 1898.

SECOND BROOD OF *SMERINTHUS POPULI*.—On May 25th I took two specimens of *S. populi*, male and female. The male I killed, keeping the female to obtain eggs. The eggs hatched out on June 9th, and in due course the caterpillars went to ground. I was surprised on looking in my box on Aug. 13th to find a perfect insect of *S. populi*, several others emerging a few days later. Is this not of unusual occurrence? as the chrysalids were not forced in any way; or is the species usually double-brooded?—JACK FORSTER; Arundel House, Hayling Island, Hants.

[There are previous records of this species attaining the perfect state in late summer or early autumn; the most recent cases are referred to, Entom. xxix. 315, and xxx. 274.—ED.]

ACHERONTIA ATROPOS IN KENT.—A perfect specimen of *A. atropos* was taken in the Calverley Road, Tunbridge Wells, on Oct. 3rd last.—R. A. DALLAS BEECHING.

CUCULLIA ASTERIS NEAR WINDERMERE.—On Sept. 16th, noticing great quantities of golden-rod (*Solidago virgaurea*) growing in a wood to the north-west of Windermere Lake, I determined to beat for *Eupithecia* larvæ, and with the possible chance of turning up *C. asteris*. It was not long before a wriggling, shiny and brightly-striped larva fell into the umbrella, and I felt that my luck had not forsaken me. Though I had never seen it before I felt sure, from the description, that it was none other than *asteris*. I gave up beating, and by searching found three more. Two

were quite full fed, and as the plant was well-nigh over, I do not doubt that others had turned. The next day I went in quest of the same insect in an opposite direction near Winster, and was greatly rewarded by again discovering this beautiful caterpillar, finding as many as seventeen; and on a subsequent search near the same ground on Sept. 19th, adding nearly two dozen more. I had no idea the species was so common, and a little systematic searching was all that was required. The larva is a very conspicuous object, and lies quite exposed near the top of the plant amongst the flowers, which it seems to eat in preference to the leaves. There are four distinct varieties as regards colour:—1, a pale yellowish green; 2, a darker olive-green tint; 3, a delicate pink; and 4, a similar pink ground, but having the two stripes on either side of mediodorsal stripe, which was in all cases a bright yellow, of a distinctly dark maroon colour. The plants in this place were not so far advanced, and though many of the larvæ were full-grown, some seemed to belong to a later brood. All but four had spun their cocoons by Sept 29th. A dried-up skin of a larva and one pupa of an insect very similar, if not identical, have been given me by a friend living near Lake Side. He found the two larvæ early in August, feeding on Michaelmas daisy in his garden. They certainly belong to the "sharks," and as certainly are not *chamomillæ* or *umbratica*; and my reason for doubting that they are *asteris* is that six weeks is a long period for the larval stage of any of this genus to extend over, and my *asteris* larvæ refused to eat Michaelmas daisy leaves, though they nibbled at the flowers. I wonder if they can possibly be *C. gnaphalii*. I believe the two larvæ have been taken in company in Darenth Wood. It is to be hoped that the one pupa which I possess will live to tell its own tale in course of time.—ARTHUR MILES MOSS; Kendal, Oct. 12th, 1898.

SPHINX CONVULVULI IN ENGLAND.—Records of the capture of this species during September and October of the present year have been received as follows:—

Berkshire.—On Sept. 17th I had a female *S. convolvuli* brought to me, and on the 20th a male ditto, both taken within half a mile of my house.—W. E. BUTLER; Hayling House, Oxford Road, Reading, Oct. 1st, 1898.

Devonshire (North).—By the kindness of Dr. Ernest Gardner, of Ilfracombe, I was enabled to take several specimens of *S. convolvuli* towards the latter end of September. All were taken in the same garden, as they hovered round a large patch of the tobacco-plant in flower. With the regularity of clockwork they came down each night at 6.30. Variation in the light did not seem to affect them at all. Less than half an hour's work on two successive evenings brought eight specimens to the net. We could have taken more, but it seemed a pity to make too severe an onslaught on a fine species, so uncertain in its appearance in this country. One evening, Dr. Gardner tells me, there were as many as thirty of these great moths flying around the tobacco-plants at the same time. He had never come across the species in any stage in the district before. *Sphinx ligustri* and *Smerinthus ocellatus* he had met with, commonly breeding them every year.—HAROLD HODGE; 6, Crown Office Row, Temple.

Essex.—On Sept. 22nd I had a specimen of *S. convolvuli* brought to me, that had been taken at Stratford a few days before.—A. W. MERA; 79, Capel Road, Forest Gate, Sept. 26th, 1898.

Gloucestershire.—From Sept 20th to 24th I have had every evening the great pleasure of watching the flight of *S. convolvuli*, the very perfection

of grace and power, as these fine insects swooped down upon my large *Nicotiana* bed, and darted from flower to flower, sucking out the honey with their long probosces while poised on quivering wing. Probably, altogether, a dozen were seen, of which my son and I took four, mostly in excellent condition.—(Rev.) ALEXANDER NASH; Standish Vicarage, Stonehouse, Glos., October 17th, 1898.

Hampshire.—Several specimens of *S. convolvuli* were taken at Christchurch during the month of September.—A. DRUITT; Christchurch, Hants.

Kent.—Two very fine specimens of *S. convolvuli* were captured here on Oct. 3rd.—R. A. DALLAS BEECHING; 24, St. James Road, Tunbridge Wells. From Sept. 19th to 24th my friend Mr. V. Horsley and myself captured eleven specimens of *S. convolvuli* hovering over beds of the tobacco-plant.—F. A. SMALL; 95, Westgate, Canterbury, Oct. 6th, 1898. I was fortunate in capturing a fine specimen of *S. convolvuli* near Tunbridge Wells on Oct. 3rd. I took a lovely specimen here a few years ago.—M. M. PHIPPS; Woodside View, Victoria Road, Southborough, Oct. 11th, 1898. From Sept. 17th to 24th I took nine specimens of *S. convolvuli* flying over tobacco-plants in our garden; and a worn one was brought to me by a boy, who found it on the pavement. Three of the nine were in good condition, but the others were only fair.—D. CHITTENDEN; Carlton Villas, Hunter Road, Willesborough, Ashford, Kent, Oct. 15th, 1898.

Middlesex.—In passing the church of All Hallows, Barking, near Tower Hill, City, last Tuesday, Sept. 20th, I saw a fine specimen of *S. convolvuli* near the church porch, but out of reach; a lad, however, dislodged it with his cap, and it was finally captured opposite the church, in Mark Lane Station, unfortunately somewhat rubbed by the summary method of dislodgment. This is the second specimen of *S. convolvuli* I have captured in the London district, the previous one being taken at rest about ten years ago, in Fernie Park Road, Crouch Hill.—HENRY A. KING; 5, Harringay Park, Crouch End, Sept. 24th, 1898.

Somersetshire.—My son Mr. A. Basil Cottam took two fine specimens of *S. convolvuli*, both in excellent condition, hovering over flowers of *Nicotiana affinis* at dusk in his garden at Bramblecroft, Bridgwater, last month. The first, taken on Sept. 23rd, is a male; the second, a fine female, was taken on the 25th. When he saw the last he had no net, so he struck it down with his straw-hat, and picked it up, stunned, but quite uninjured. He remarks that he saw others in his garden, but all were hovering over one particular plant of *Nicotiana*, though there were a number of other plants of it all round and in full bloom which the moths entirely neglected. A third specimen was taken in the garden of the adjoining house on Sept. 20th, but was much damaged by rough handling.—ARTHUR COTTAM; Eldercroft, Watford, Oct. 17th, 1898.

Suffolk.—The capture of several specimens of *S. convolvuli* at Henley and Westerfield, near Ipswich, has been recorded in our morning newspaper this week, under the heading, "Giant-moth in Suffolk." Apparently it is common this year.—CLAUDE A. PYETT; 28, Waterloo Road, Ipswich, Sept. 25th, 1898.

Surrey.—I received a specimen of *S. convolvuli* taken at Ewell on Sept. 21st.—A. FICKLIN, Junr.; Norbiton, Kingston-on-Thames. A nice specimen of *S. convolvuli*, which flew into a house at Hambleton about the end of September, was sent to me, and arrived in good condition.—W. ASTON; Fairfield East, Kingston-on-Thames. It may be of interest to record the capture of a specimen of *S. convolvuli* on Sept 29th, at Addle-

stone, Surrey, by my nephew. The insect was forwarded to me by post, alive.—E. H. TAYLOR; 5, Elsenham Gardens, Southfields, S.W. Between Sept. 14th and 17th I had four specimens of *S. convolvuli* brought me by boys, all of them having been found in one portion of the parish.—(Rev.) J. E. TARBAT; Holmlea, Weybridge.

Worcestershire.—Two specimens of *S. convolvuli* have occurred at Malvern; one was unfortunately caught by a cat and, as a matter of course, came to grief. The second was taken in a greenhouse, in fair condition. I have also heard of others having been seen flying over *Nicotiana affinis*.—W. EDWARDS.

NONAGRIA CANNAE.—Mr. E. A. Bowles and myself obtained a grand lot of pupæ of *N. cannae* at Horning in July last.—M. M. EDELSTEN; The Elms, Forty Hill, Enfield, N.

VANESSA ANTIOPA AT CHRISTCHURCH.—A very fine specimen of this insect was taken by Mr. T. Tapsell, of Christchurch, within a few miles of the town, in the second week in August. It was disturbed in a small plantation of oak, birch, and willow.—A. DRUITT; Christchurch, Hants, Oct. 1st, 1898.

CAPTURES IN THE TUNBRIDGE WELLS DISTRICT.—I have been fortunate in capturing several scarce insects this season, and from among them I should like to mention a few I have taken for the first time in this district. Two of them I think are of great interest, *Agrotis cinerea* and *Spilodes palealis*, as I never heard of either of these species being taken except on the chalk, and generally near the coast. One specimen of *Ennomos fuscantaria* is of a much lighter shade, less of the fuscous colour than some I have from York. Also *Apamea ophiogramma*: I believe I have taken this species here before, but am not quite certain, as the few previous specimens have always been too much worn to properly identify them; the present example is darker than some I have from Cambridge; it is also suffused with a very rosy tint, which gives it a pretty effect. I should also note that the *A. cinerea* is light brown in colour, instead of the more usual slaty grey tint.—M. M. PHIPPS; Woodside View, Victoria Road, Southborough, Kent.

GRASSHOPPERS AT SUGAR.—Mr. W. J. Cross, of Ely, sent me a pair of *Meconema varium*, and a female *Thamnotrizon cinereus*, which he took off his sugar, in the New Forest, on Sept. 16th. The former insect I have on two occasions found on sugar (*vide* Entom. xxx. pp. 28 and 76), but had not previously heard of the latter visiting it.—W. J. LUCAS; Kingston-on-Thames.

HELIOTHIS PELTIGERA AND XANTHIA GILVAGO.—A very good specimen of *H. peltigera* was taken in a clover-field at Aberporth, Cardigan, on Aug. 15th; and a fine specimen of *X. gilvago* was taken at light here about the middle of September, both of this year.—J. B. MORRIS; Maldon House, Maldon Road, Wallington, Surrey, Oct. 16th, 1898.

DASYCHIRA (ORGYIA) PUDIBUNDA IN OCTOBER.—This morning, Oct. 19th, a fine female of *O. pudibunda* emerged from a pupa in my breeding-cage. This cage was in a cool room, and consequently the pupa could not have been "forced."—E. T. B. REECE; Cardiff.

STAUROPUS FAGI AT EPPING.—On Sept. 20th, while beating in company with Mr. Garland, I took a nearly full-grown larva of *S. fagi*.—ALFRED ALDER; Albert Road, Leyton, Oct. 16th, 1898.

ENNOMOS AUTUMNARIA (ALNIARIA).—This insect comes to the lamp outside my front door nearly every year. I took two specimens, male and female, last month (September), and I have a batch of eggs. Three years ago I had a similar batch, and the larvæ fed up very well, but instead of changing to pupæ they got diseased, and all died except one. I should be annoyed were this to happen again, so if any of my old correspondents would like to try their hands at rearing the insect, I shall be pleased to divide the eggs between us.—J. P. BARRETT; 3, St. John's Villas, St. Peter's Footpath, Margate.

HADENA PISI: EXTRAORDINARY ABUNDANCE IN THE LARVAL STATE.—Last month a friend drew my attention to the fact that the larvæ of *H. pisi* were to be obtained in great numbers at Shepherd's Bush. The locality turned out to be a large brickfield which had been in disuse for many years. Lying fallow for so long, the place has become a veritable wilderness. I noticed that the wormwood flourishes there exceedingly, and from the hollows the massed plants much resembled a miniature fir-forest, so dark and dense did they seem against the clear blue sky. In this tangled waste of thistles, nettles, yarrow, &c., the melilot asserted itself strongly—sometimes attained a height of nearly seven feet. The larvæ of *H. pisi* simply swarmed upon it, preferring it to any other pabulum, and large areas were completely devastated by these larvæ. To see them resting on the bared and bleached stems of the melilot, fully exposed to the fierce rays of the sun, was a most unusual sight on one of the very hottest days of the year. Within a stride a score could be obtained, and all forms of the larvæ known to me were represented. It is no exaggeration to say that ten thousand could have been taken with little difficulty, and the gregarious cocoons of its parasite were striking objects in the brilliant sunlight, strongly resembling, superficially, nests of spiders' eggs. Although in nearly all parts of the field there was very strong evidence of larval depredations, the only other larvæ I observed were a few examples of *Hadena oleracea*. I have omitted to mention that my friend saw a boy collecting *H. pisi* at tenpence per thousand, and a man was also observed with a pail which he was using for the same purpose. I have never seen before such strong evidence of the voracity of lepidopterous larvæ; it therefore was a new experience, and a sight not easily to be forgotten by an entomologist.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury, W., Oct. 21st, 1898.

BOARMIA RHOMBODARIA DOUBLE-BROODED.—A small female of the above species was taken in Richmond Park at the end of last month. By its size and condition it is probably an example of a second brood.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury, W., Oct. 21st.

PLUSIA MONETA IN SURREY.—I may mention that early in the summer larva of *P. moneta* were again found in the same garden from which the species has been recorded in previous years.—(Rev.) J. E. TARBAT; Holmlea, Weybridge.

ERRATA.—P. 235, line 11, for "dominal" read "dominant"; p. 244, line 4, for "*Stilbia anomala*" read "*Caradrina ambigua*"; p. 257, for "Notes on Lepidoptera in 1897" read "in 1898"; p. 258, line 6 from top, for "*E. frequentella* (common)" read "*Coleophora lutipennella*."

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 5th, 1898.—Mr. R. Trimen, F.R.S., President, in the chair. Mr. T. B. Fletcher, of H.M.S. 'Centurion,' China Station; Mr. Claude Fuller, of the Department of Agriculture, Cape Town; Mr. Alexander Greenshields, of 38, Blenheim Gardens, Willesden, N.W.; and Mr. Oliver J. Janson, of Cestria, Claremont Road, Highgate, N., were elected Fellows; and Mr. John W. Downing, of 45, Trevelyan Road, Tooting Graveney, S.W., was re-elected a Fellow of the Society. The President announced, with deep regret, the deaths of Mr. Osbert Salvin, F.R.S., a member of the Council, and of Dr. E. Candèze, a Fellow of the Society, which had taken place since the previous meeting. The President also announced that the late Mrs. Stainton had bequeathed to the Society such entomological works from her husband's library as were not already in its possession. This bequest was of great importance, and would add to the Library a large number of works, many of which, formerly in the library of J. F. Stephens, were old and now scarce. Among the more important additions were copies of Clerck's '*Icones Insectorum rariorum*'; Say's '*American Entomology*' (1817), a work of extreme rarity; Goeze's '*Entomologische Beyträge*,' complete; Donovan's '*Insects of New Holland*'; Linnæus's '*Systema Naturæ*,' ed. x.; Godart and Duponchel's '*Lépidoptères de France*'; Harris's '*The Aurelian*,' ed. i.; and Sepp's '*Nederlandsche Insecten*.' There were also numerous modern works dealing with the lepidopterous fauna of Europe. Mr. J. J. Walker exhibited a black form of *Clytus mysticus*, L. (var. *hieroglyphicus*), taken by Mr. Newstead at Chester, where about one per cent. of the specimens were of that variety; also a black variety of *Leipus nebulosus*, L., from the New Forest. Mr. Tutt exhibited an example of *Euchloë cardamines* irregularly suffused with black markings, and a series of local varieties of Lepidoptera from Wigtonshire. Mr. S. Image exhibited a specimen of *Acidalia herbariata*, taken in Southampton Row. Prof. Poulton showed and made remarks on specimens of *Precis octavia-natalensis* and *Precis sesamus*. These strikingly dissimilar insects had been shown by Mr. G. A. K. Marshall to be of seasonal forms of the same species; from two eggs laid by a female of the first mentioned (summer) form he had bred one imago resembling the parent, and one which was of the blue *sesamus* form. On behalf of Dr. Knaggs, Mr. South exhibited a series of *Dicrorampha*, the synonymy of which was discussed by him and Mr. Barrett, *D. flavidorsana*, Knaggs, being shown to be a good species. Mr. Barrett exhibited and made remarks on specimens of *Lozopera beatricella*, Wals., from Folkestone, and the allied species. Mr. Porritt showed examples of *Arctia lubricipeda*, obtained by continued selection of the parents, and probably the darkest ever bred in this country. Mr. Adkin exhibited a long series of *Taenioctampa gothica*, to show the results of breeding by continued selection, and some remarkable forms of *Abrazas grossulariata* from Pitcaple. Mr. F. Merrifield read a paper, illustrated by a large number of specimens, on "The colouring of Pupæ of *P. machaon* and *P. napi* caused by exposing the pupæ to coloured surroundings." The pupæ of both species were found to be modified by the surroundings of the larvæ, the effect being extremely marked in the case of *P. napi*. When the larvæ of the latter species were kept in a cage

half orange-coloured and half black, all but four of the pupæ on the roof of the orange-coloured side were green with very little dark spotting, and all the pupæ on the roof of the black side were bone-coloured with numerous dark-brown spots. He regarded the phenomenon as protective. The exhibit was discussed by Prof. Poulton, who showed a similar series of specimens, and observed that he found the rays near the D line of the spectrum had the greatest influence upon the incipient pupæ, the effect diminishing towards either the red or the violet ends. The effect therefore appeared to be one of luminosity. Mr. Bateson stated that his own experience fully confirmed Mr. Merrifield's results, but to establish that the green colouration of the pupæ was protective in the winter brood required the consideration of a number of points, so far untouched. Mr. G. H. Verrall read a paper on "Syrphidæ collected by Colonel Yerbury at Aden," the specimens, together with some rare British Diptera, being exhibited by Col. Yerbury. Papers were communicated by Mr. G. C. Champion on "The Clavicorn Coleoptera of St. Vincent, Grenada, and the Grenadines," based on the determinations of M. Grouvelle, and by the Rev. T. A. Marshall on "The British Braconidæ, Part VIII."—W. F. H. BLANDFORD, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—Sept. 22nd.—Mr. J. W. Tutt, F.E.S., President, in the chair. Mr. R. Adkin exhibited a short series of *Dianthæcia nana (conspersa)* from Shetland, and read notes on the variation. He also exhibited, on behalf of Mr. Reid, of Pitcaple, a long series of *Tæniocampa gothica*, the result of breeding from selected parents through some four generations, and read notes on the variation; a very distinct form of variation of *Abraxas grossulariata*, in which the black markings were absent from the central areas of all the wings, the discoidal marks only being present; a series of *Melanthia bicolorata* var. *plumbeolata*; and very fine examples of *Pachnobia hyerborea (alpina)* from Perthshire. Mr. Lucas, specimens of five of the less common species of British dragonflies, viz.:—*Sympetrum sanguineum* and *Libellula fulva*, from Sandwich, Kent; *S. flaveolum* and *Æschna mixta*, from Ockham Common; and *Agrion mercuriale*, from the New Forest. Mr. Tutt, a large number of *Zonosoma annulata (omicronaria)*, bred by Dr. Riding from selected parents, to show the hereditary nature of the absence of the annulus. Some seventy-five per cent. of the imagines bred were without the annulus on the fore wings. The President, for Mr. Thornhill, a curiously-marked specimen of *Euchloë cardamines* from Cambs, having two wings curiously clouded with black; and for Mr. Manger, a box of insects of all orders, captured at sea, among which were *Deilephila livornica*, *Cherocampa celerio*, *Macroglossa stellatarum*, *Patula macrops*, *Abraxa perampla*, and *Acridium peregrinum*. Mr. Dolman, a wonderful specimen of *Abraxas grossulariata*, taken on a tree-trunk by a boy, in which the black markings were normal, but having the ground colour of a uniform deep orange; and ova of *Aporia cratægi*, from Dover. Mr. Hall, several specimens of an ant found in the burrows of *Sesia sphegiformis*. Mr. West, of Greenwich, bred specimens of the Hemiptera, *Podisus luridus* and *Goniocerus venator*, both from Box Hill. Mr. Turner, a bred series of *Porthesia chrysorrhæa* from North Kent larvæ; a larva of *Dicranura bifida*. Mr. Dennis, the ova of *Thecla w-album* under the microscope.—HY. J. TURNER, *Hon. Report Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—September 19th, 1898.—Mr. G. T. Bethune Baker in the chair. Mr. R. C. Bradley showed *Brachypalpus bimaculatus* from Sutton, one female, taken on July 3rd this year. He said that the species was exceedingly rare, almost the only other captures he knew of being two males taken in Sherwood Forest in 1892, by himself and Mr. C. J. Wainwright. Mr. A. H. Martineau, *Ammophila sabulosa*, bred from a pupa found in the New Forest last June; also *Spilomena troglodytes* and *Stigmus solstagi* from Solihull, both of which, he said, were amongst the smallest species of our British Aculeates. Mr. W. Wynn, *Cosmia affinis*, *Numeria pulveraria*, *Cidaria ribesaria* *Eubolia cervinaria*, and a long, bred, and very beautiful series of *Triphæna fimbria*, all from Hampton in Arden; also a long, bred series of *Cucullia verbasci* from Wyre Forest, and a single specimen of *Acidalia straminata* from Wyre Forest, the latter being a new record. Mr. H. Willoughby Ellis, a series of beetles from Cannock Chase, including *Orchesi micans*, *Miscodea arctica*, and many others. Mr. G. T. Bethune-Baker, two drawers from his collection, containing the genera *Neptis*, *Junonia*, and *Limenitis*.

The meetings of this Society will be held for the future at the Norwich Union Chambers, Congreve Street, Birmingham. They are held on the third Monday in each month, and entomologists are cordially invited to be present.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

KENDAL ENTOMOLOGICAL SOCIETY. — October 10th, 1898. — The President in the chair. There was a good attendance, and three new members were elected. The room is now excellently lighted with incandescent gas-lights, and is altogether very comfortable and satisfactory for meeting purposes. A paper on "September Collecting in the Lake District" was read by the President, dealing chiefly with the search for *Cidaria reticulata* and *Cucullia asteris*; the former of which has apparently vanished, and the latter, in the larval stage, has turned up in considerable number on the golden-rod (*Solidago virgaurea*). *Vide* article on *C. asteris*, by Rev. A. M. Moss, *ante* p. 264. Mr. Moss then reverted to the former insect, and gave the life-history of, and his experiences with *C. reticulata*. The first note-book for the records of local butterflies is now in process of compilation, and was shown to the members present. The exhibits, produced by Messrs. Doherty, Graveson, Holmes, Littlewood, Moss, Smith, and Wright, as usual, embraced many points of interest, and showed some good captures. As many as five or six specimens of *Sirex gigas* have been caught in the neighbourhood this year, and there seems good reason to believe that it has become established. Sugar has been yielding pretty plentifully lately, and the results embraced the following:—*Phlogophora meticulosa* and *Xanthia ferruginea* (both abundant), *X. silago*, *X. cerago*, *Cerastis vaccinii*, *C. spadicea*, *Scopelosoma satellitia*, *Anchocelis rufina*, *C. litura*, *Epunda nigra*, *Miselia oxyacanthæ*, one *Agrotis saucia*, and about nine *Calocampa exoleta*. The Secretary begs leave to modify the description of variety of *Epinephele ianira*, recorded in September. The specimen is not like Newman's figure, and differs chiefly from the type by having the yellow patch replaced by almost pure white. He apologizes for error.—A. M. Moss, *Sec.*

RECENT LITERATURE.

Insects: Foes and Friends. By W. EGMONT KIRBY, M.D. Preface by W. F. KIRBY, F.L.S., F.E.S. 12mo. Pp. 138. With thirty-two plates printed in colours. London: S. W. Partridge & Co. 1898.

As an elementary introduction to the study of Economic Entomology, this little volume is not without value. It has been translated and adapted from a book which we are told in the preface "has had a large sale in Germany." The plates are superior to some that we have seen in works offered to the public at a very much higher price; and the text is in no way less trustworthy than that of the more scientific manuals.

Insect Lives as told by Themselves. By EDWARD SIMPSON. Small 8vo. Pp. 128. With twenty-three illustrations. London: The Religious Tract Society. (No date.)

In the course of a series of some nineteen chapters, the author introduces several more or less familiar insects, and gives an account of the life-history and other particulars connected with each one as he is supposed to have ascertained them by an "interview" with the creature itself. Although perhaps not exactly new, this style of treatment is well chosen, as it is more likely to arrest the attention of the general reader than would expression of the same facts in the orthodox language of the naturalist. We gladly welcome every work having for its object the popularising of the study of Entomology, and we believe that the book under notice will have influence in this direction. The price is merely nominal.

ECONOMIC ENTOMOLOGY.

The Journal of the South Eastern Agricultural College, Wye, Kent. Pp. 58. Illustrated. London: Headley Brothers. August, 1898.

CONTAINS articles by Mr. Fred. V. Theobald on insects that are injurious to fruit and forest trees. The same observer points out that "grease-banding" is of little use as a preventive against the attack of the "winter moth," *Cheimatobia brumata*, as the females of this species "are carried in copulâ by the males up into the trees."

The following publications, by the U.S. Department of Agriculture, Division of Entomology, have been received:—

The San Jose Scale in 1896-1897. By L. O. HOWARD. Bulletin, No. 12. New Series, pp. 30. Washington, 1898.

The Periodical Cicada: an Account of Cicada septendecim, its Natural Enemies, and the means of preventing its Injury; with a Summary of the Distribution of the Different Broods. By C. L. MARLATT. Bulletin, No. 14. New Series, pp. 148. With frontispiece, three plates, and figures in the text. Washington, 1898.

Bibliography of the more Important Contributions to American Economic Entomology. Part VI. The more important writings published between June 30th, 1888, and December 30th, 1896. By NATHAN BANKS. Pp. 273. Washington, 1898.

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FORFICULA LESNEI, FINOT.

By W. J. LUCAS, B.A., F.E.S.



IN an early number of the present volume of the 'Entomologist' (*ante*, p. 49), I recorded and figured a male of what was then considered a rare British earwig, *Forficula lesnei*, which had been captured near Reigate by Mr. W. West, of Greenwich. During the past season (1898), while searching more especially for Hemiptera, the same indefatigable collector was on the alert for *F. lesnei*, and his efforts were crowned with unlooked-for

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success. He tells me that on Sept. 1st, while beating birch in the neighbourhood of Leatherhead, he took two males. On the 3rd of the same month, at Reigate, using the sweeping-net from 10 a.m. till 3 p.m. for Hemiptera, he swept every patch of *Ononis* he could find, but not an earwig came to the net. But when beating whitethorn, hazel, &c., *F. lesnei* tumbled into the umbrella quite commonly. There were full-grown males and females, as well as immature specimens. The mature males were more common than the females in the same state. From Mr. West's experience last season no collector of the Forficularia ought to be without *F. lesnei* in his collection, but he must use the umbrella, and not sweep *Ononis* as suggested in my previous note.

In connection with the same insect, Mr. W. J. Ashdown tells me that this earwig has occurred in many places near Leatherhead during September and October, and in some localities appears to replace *F. auricularia*. He takes them in the sweeping-net, and by beating old hedges, and does not find that they are attached to any one plant or shrub in particular. Mr. Ashdown calls attention to the fact that in many of the males the apices of the forceps are not gaping but contiguous, so that this fails as a method of distinguishing the species. The proportionate length of the dilated part also varies, and small specimens have the forceps more elongate, though none of them resemble the figure of *F. pubescens* that Mr. Burr gave in the Ent. Mo. Mag. 1897, p. 148. The antennæ of *F. lesnei* are stated to have twelve joints, and those of *F. pubescens* thirteen; but this is not of much use for purposes of identification, as earwigs are frequently found with their antennæ a few joints short, perhaps due to their occasionally carnivorous habits.

The figures represent a mature female, and the forceps of a male with the left branch deformed, which, through the kindness of Mr. West, I have been able to add to my collection. Both are magnified three diameters.

November, 1898.

A FEW NOTES ON *ACIDALIA HUMILIATA*, HUFN.

By P. W. ABBOTT.

THROUGH the kindness of my friend Mr. A. J. Hodges, I received, on June 29th last, eighteen ova which had been deposited on the 26th and 27th of that month by a captive female taken by him in the Isle of Wight. I am also indebted to my friend Mr. L. B. Prout, F.E.S., for reference to and copious extracts from Sepp and from Millière, from the former of whom

I quote the following descriptions for comparison with the results of my observation of the various stages of the ovum and larva as far as they have yet progressed :—

Acidalia osseata, W. V. (= *humiliata*, Hufn.), Sepp's 'Neder-landische Insekten,' 2nd series, vol. iv. pp. 50, *et seq.*

The writer captured a fertile female in July, 1877, upon the dunes at Overveen, which laid six ova on July 13th, of which five hatched on July 23rd.

"Eggs light red, covered with network of regular cells, somewhat more greyish and with smaller cells than those of *dilutaria*. . . . When first hatched the larvæ were dark grey, with black heads and a short hair on each segment, . . . but soon became lighter in colour, and towards the first moult pale red-brown; much less slender than most *Acidalia* larvæ, and hence cannot roll up in the peculiar spiral form taken by many of the genus. First moult Aug. 2nd-4th, second moult end of August and beginning of September. They continued active and feeding until the end of September, yet always fed slowly and sparingly. . . . The larva becomes after the first moult somewhat lighter coloured than originally, yet still almost markingless. The markings and colour of the full-grown larva do not appear until after the second moult, and are most distinct shortly after the third moult. Skin is very rough, entirely covered with wart-like spots, with several short thick hairs on head, prolegs, prothorax, and anus; one only (equally short) on each middle segment, thickened (club-shape) at the tip."

In the above extracts I have only quoted as far as the third moult, reserving the remainder of Sepp's very full description until the larvæ under my observation have successfully attained their full growth, as it renders comparison with my own observations more easy.

I am of opinion that the egg is not attached to the food-plant, but is laid in a manner similar to those of the Hepialids, in which Mr. Hodges confirms me from his previous experience of the species in its wild state, which extends over several seasons past. The keenest observation that I have been able to bring to bear upon this interesting species, in this the first attempt to rear it in captivity, has failed to detect up to the present stage any material discrepancy or inaccuracy in the exhaustive description by the well-known continental authority from whom I have quoted above, with the exception of the dates of the early moults and a few minor details. These are probably due to the hereditary effects of climatic influence and isolation in the solitary colony which, as far as has been found at present, constitutes the only foothold of the species in England.

The ova which I had under observation were apple-shaped, of a light brick-red, reticulated with small and uniformly sym-

metrical shallow cells, growing darker until the larvæ emerged, from July 6th to 8th. They soon became lighter in colour, and towards the first moult became light reddish brown, as described above; and in this particular I am glad to be able to confirm Sepp's description, as Millière states that the colour in this stage is "white inclining to greenish," which I do not find to be the case.

With regard to the position assumed by the larva when disturbed from its food-plant, I find it most nearly to resemble a broad U-shape, which appears, from the general habits of this very sluggish larva, to be merely the result of lethargy.

With regard to the dates of the first and second moult, my observations correspond within a few days with those quoted above; but some of the larvæ under my care appear to have made their third moult before the end of September, and upon which the markings more nearly assimilate to those of the full-grown larva. They all appear to be most erratic feeders, a few warm days causing them to be quite lively and to feed well; whilst a short spell of cold weather had the effect of making them sit on their food-plant as though they were going into hibernation at once.

A striking feature in the larva, in its third skin, is the "fish-scale form" pattern, which is most distinct on segment 8, and which is noted by Sepp, whose description I will quote further when I have completed my observations of the later stages of this most interesting larva, should I be fortunate enough to get them safely through hibernation. At present they appear to be healthy, and I have every hope that I shall be able to complete my observations of the entire life-history.

I was in the Isle of Wight with Mr. Hodges this year during June, and in company with him I made my first acquaintance with the species in its somewhat inaccessible locality. I spent about three hours at the most tiring collecting that I ever remember to have experienced, owing to the roughness of the ground. However, as I was successful in obtaining five specimens, mostly in very fine condition, I felt amply repaid for my exertions. I did not, however, succeed in getting any females, but subsequent comparison in a series captured by Mr. Hodges shows them to be much smaller than the males, and with narrow pointed wings, whereas the males have fuller, broader, and rounded wings.

Sutton Coldfield.

THE SUMMER SEASON OF 1898.

BY ALBERT J. HODGES.

I HAVE noticed, since my return from active collecting this season, a great sparseness of "records" of interesting species of Lepidoptera: whether this arises from the absence of good species in general, or from fear of the "Extermination Committee's" wrath, I know not; but it is regrettable, from whatever cause arising.

I did not emerge from my "hybernation" until June, and even then it almost needed to build a fire under me before I could be got to work; and I think but for the persevering energies of Mr. P. W. Abbott in stimulating my ardour with prospects of enjoyable trips that I should have let the season pass. However, June 6th saw me well under way to Wicken, in company with Mr. J. P. Mutch, where by arrangement we met Mr. Abbott, thus completing our trio. The abnormal cold nights of that month are a matter of history, and we certainly found the mid-night temperature approaching arctic severity. Our first few nights resulted in nothing beyond *Apamea unanimis*, and single specimens of *Meliana flammea*, *Arsilonche venosa*, &c.; but, nothing daunted, the well-known "Eddystone" shed its radiance nightly, and, as usual, perseverance had its reward. The "little favourite" of the fen evidently dislikes the "madding crowd" of common moths, for its appearances were reserved for nights when there was hardly an insect on the wing. Upon one occasion, during the whole night from 10 p.m. to dawn, only five moths came to the light, of which two were *Hydrilla palustris*. Between June 11th and 17th (when we left) our trio captured twenty-one specimens, including one black variety, which fell to the lot of Mr. Abbott. Our greatest take in one evening was eight, which I trust is a "record." There were on some evenings no less than seven lamps at work besides our own, and, as I can only account for a total take of about forty specimens, I think the "Eddystone's" share of twenty-one a very good percentage. By day we found the usual numbers of *Bankia argentula* at Chippenham, where I also understand that larvæ of *Plusia chryson* were in fair plenty. We were too early for Tuddenham, but found *Lithostege griseata* in some numbers.

A fortnight of fen work being, in our opinion, ample for anyone at a time, we packed up, and went to Freshwater, arriving there on June 18th, losing no time, but spending the same evening on the nearest approach we could find to fens, namely, a tidal estuary, odoriferous and moist. A long series of *Acidalia emutaria* rewarded us, but sugar was useless in the woods. Its attractiveness, however, improved during the next fortnight or so, culminating towards the middle of July, when I got a fine and

long series of *Agrotis lunigera*, *A. corticea*, *A. lucerneæ*, *Hadena dentina*, &c., upon the Downs. Earlier in the month I found the more sheltered spots at the foot of the Downs more remunerative, and from the last week of June to about July 2nd various species of Noctuæ were attracted in considerable numbers, amongst which the best were *Neuria saponariæ* (*reticulata*) in unusual plenty, *A. putris*, *Caradrina morpheus*, with two only perfectly fresh *Triphæna subsequa* (*orbona*, Hufn.). During this period the top of the Downs was occasionally worked, but the usual species appeared to be unusually late; and at the date when *A. lunigera* should have been fully out, I only succeeded in finding *A. cinerea*, five specimens being taken at the same time off one clump of thistles. *Setina irrorella* was in abnormal abundance, and I took a long and fine series by searching during the day, but, however, as usual, failed to find the "ivi variety."

My friend Mr. P. W. Abbott was very anxious to make acquaintance with *Acidalia humiliata*, and visited the spot where they occur, in company with me, during the last week in June, succeeding in capturing about half a dozen specimens; but he was disappointed in not obtaining a female. In this I was fortunately more successful, and, having induced her to lay, I sent the ova to him, and have recently had the pleasure of seeing the larvæ, and of comparing them with the continental authorities. I am much amused at the wild and frantic efforts made by many of our most energetic "collectors" (I mean *sale-room* collectors) to try and persuade both themselves and their friends that this unwelcome little stranger has no rights of entry to their cabinet, and I would not like to be unkind enough to suggest that it is because in spacing out their columns there is no "blank" left for it. Another cogent reason is that it does not appear in "Newman," and in cutting up their label-list no mystic printed slip is found for it. Rather let us fill our cabinets with dead and gone species like *Polyommatus dispar* and *Lalia cænosa*, or artificially preserved ones as *Ocneria dispar*, than find room for an addition to our existing species. I am, however, wandering from my subject, as I did from my own pet locality when I made my first trip for *real* British *Melitæa cinxia*. Although working the Isle of Wight for years past, I never worked for that species until this season, and I think that my efforts in that direction will not call down upon me "anathema maranatha" from the irresponsible arbiters of permissive field-work, as only three specimens were taken. It was, however, a satisfaction to visit the locality, which I am afraid had been previously drawn upon, or there would surely have been abundance of worn specimens on the wing, especially as I was very late. I have had a very wide experience of this species in Guernsey and Sark, and would beg all entomologists to be sparing in their captures of the

larvæ, or it will soon be added to the list of extinct species. In my opinion this is one of the (if not *the*) only species of Macro-Lepidoptera which needs "protection," especially in its gregarious larval stage.

Amongst Geometræ, *Anticlea rubidata* was in swarms, it being easy to net three or four at a time, mostly fine. I succeeded in obtaining ova also of this species for my friend Mr. Abbott. After a long experience of collecting at Freshwater, my notes of the 1898 season show an abnormal abundance (comparatively) of *A. cinerea*, *S. irrorella*, *A. rubidata*, *N. saponariæ*, *A. putris*, *M. anceps*, and *A. corticea*, with a scarcity of *A. lucerneæ*.

On July 25th I started for South Devon, a cross-country route taking up nearly the whole day. The heat was abnormal, and tourists objectionally plentiful *en route*, entomological paraphernalia being quite out-classed by cameras and bicycles. I arrived at my destination weary and dry, but fortunately in time for the ever-ready treacle-pot and net. Casual search during a long walk to my collecting ground revealed a few larvæ of *Heliothis peltigera* feeding on small plants of *Hyoscyamus niger*; time did not allow of a careful search, which was postponed till the morrow. Dusk revealed the fact that *Lithosia caniola* was scarcer than usual, which is not surprising, seeing that it straggled out until early September, when I took my last fine female. Sugar also proved very little use, and consequently *Leucania putrescens* has remained a scarcity in my store-boxes this season. Persevering work every night, good or bad weather, brought together, however, a few of each species, but in spite of all our efforts the great success of the previous season was not repeated, *Laphygma exigua* and *Leucania albipuncta* neither rewarding our most zealous efforts during August. *Caradrina ambigua* occurred singly upon the very same date of its first appearance in 1897 (about Aug. 5th), but did not come at all freely until a fortnight or so later. Our first success was Aug. 23rd, when a good *H. armigera* was taken at 11.30 p.m. at sugared flowers of *Knautia arvensis*, a second and very worn one being captured Sept. 13th. On Aug. 27th sugar suddenly became very attractive, the weather having broken utterly, and cold driving showers falling all day, until 4 p.m., when the sun broke through. The evening was bitterly cold, and the herbage soaking, completely wetting one through and chilling to the marrow. Noctuæ evidently, like water companies, were tired of the drought, and simply swarmed, *Phlogophora meticulosa*, *Noctua xanthographa*, *P. gamma* in excess; but I think I counted up to twenty-six or twenty-seven different species of Noctuæ, although the late autumn species had not shown up at all, even *Xanthia circellaris* not coming until Sept. 12th. So excited were the dissipated crowd that I found *Noctua c-nigrum* in cop. with *N. xanthographa*. However, my principal capture was *Leucania vitellina*, of which

I took one about 9.15, and a second at 10.15, both feeding freely under a coldly brilliant moon and an absolutely cloudless sky, with a cold high south-west wind. My success was subsequently repeated, single specimens falling to my boxes on Aug. 29th, 30th, 31st, and Sept. 2nd, 3rd, and 7th, of which five are absolutely perfect, and all are good. What appear to me to be the females are larger and more fulvous than the males, with dark wing-rays on the hind wings; whilst the others are a paler straw-colour, with less distinct markings. The weather was bad during the days of the first three captures, usually blowing a gale; in one case I took the specimen in broad daylight, before thinking of lighting up at all.

Agrotis saucia was very plentiful and in lovely condition, *A. obelisca* sparing, and only single specimens of *Heliothis peltigera* and *Plusia festucae* came to the sugar. After the gale had blown itself out, we had a series of still cold damp nights, when only *N. xanthographa* remained faithful; but geometers then took up the running, a second brood of *Larentia pectinataria* appearing, amongst which I took varieties with the dark band more or less obsolete. On Sept. 1st a fine fresh male *Camptogramma fluviata* visited my heads of *Eupatorium cannabinum*, and was promptly secured; this was a valuable item, as it put me on the alert, and I looked out well for this little rarity, until Sept. 7th, when at supper at my diggings, about 10.45 p.m., a fine fresh female flew in to the lamp, and was cyanided *pro tem.* and examined. On reviving she obligingly laid sixty-four eggs, which proved fertile, to my great surprise, as the female appeared absolutely fresh. These larvæ nearly came to a sad end, as they were preceded by a voracious brood of *Lithosia caniola* larvæ which hatched from ova laid previously in the same chip-box. However, my friend Mr. Abbott (to whom I entrusted the ova) proved equal to the occasion, and remorselessly settled these ferocious-looking little "cuckoos" ere they could do harm. At the time of writing (Nov. 2nd) we have a dozen of these same *C. fluviata* on the setting-boards, all males unfortunately.

My run of luck was not yet over, as on Sept. 10th I took another fertile female at sugar, which laid about two dozen eggs. These I sent to my friend Mr. A. W. Mera, who has also been successful in getting them through. A last specimen was secured Sept. 13th, but was a fine male; on the same evening I also took the second *H. armigera* (previously referred to), and a very worn *L. exigua*, which I kept on the off-chance for eggs. As I was leaving next day I brought it up alive, but it died without laying, and examination inclines to the opinion that, as with the worn one I kept in 1897, it was a male. Better luck next time; but altogether I have no reason to join in the general wail of 1898 as a bad season.

Colias edusa occurred very sparingly, and seemed to pass over

on one day, and disappeared almost completely; *Vanessa cardui* was very common; also *V. io*, *V. atalanta*, &c.

I have not met with any exceptional good fortune in the way of varieties during the season, but during early July I renewed my acquaintance with the confluent form of *Zygæna trifolii* at Freshwater, and obtained very fine extreme forms. With the erratic species *Z. filipendulæ* I had better success, meeting with a small but numerous colony about Aug. 2nd in South Devon. I worked it steadily for over a month, and obtained five of the yellow variety, three of which, in fine condition, showed a very rich colour, contrasting beautifully with the metallic green, and altogether a handsomer variety than I had obtained some years before in the Isle of Wight.

After my return to London, on Sept. 14th, I crossed to Guernsey for a short business visit, during which I found *Sphinx convolvuli* in great abundance, six or eight being seen together at one small bed of *Nicotiana affinis*. Although quite without apparatus, I could not resist the temptation of catching a few, thus finishing my active season's collecting.

TWO SEASONS AMONG THE BUTTERFLIES OF HUNGARY AND AUSTRIA.

By MARGARET E. FOUNTAINE, F.E.S.

HAVING spent the greater part of two successive summers in one or other of these two countries, I think perhaps a few remarks on the principal Rhopalocera belonging to them would not be otherwise than useful and interesting to the readers of the 'Entomologist.' Last year I was in Austria during the first three weeks in May, making Vienna my head-quarters, as Dr. Staudinger had recommended that neighbourhood to me before any other. Here I was fortunate in making the acquaintance of Baron Adolf Von Kalchberg, of Hietzing, who most kindly wrote out a paper for me, giving the localities for all butterflies of any importance to be taken in that neighbourhood. However, the spring of last year was so cold and wet, that I did very little collecting till I returned to Vienna at the end of June, leaving again on July 12th for Herkulesbad, a charming Hungarian watering-place in the Mehadia district, where I found several very interesting species; but being too late to secure fresh specimens of all I saw, on Aug. 7th I left, resolving to return this year, and went back to Vienna, in which vicinity I remained more or less till the end of the month. This summer I visited Hungary only, arriving at Buda-Pest in the end of May. Here I became acquainted with a number of Hungarian entomo-

logists, from whom I received the greatest kindness and assistance. They invited me to attend their meeting every Friday evening (of which Dr. Uhryk Nándor was the president), where they discussed entomology in all its various branches; also arranged expeditions for the ensuing week, in most of which I accompanied them, till about the middle of June, when I again found myself at Herkulesbad till the end of July, when I returned to Buda-Pest till the middle of August, stopping a few days at Kavarán-Szakul on my way back, a village passed on the line south of Temesvár. I will now proceed to describe the results of my collecting.

Papilio podalirius var. *zancleus*, Z.—This variety is taken at Buda-Pest in August, but the specimens I saw had not the abdomen so entirely white as those of Sicily.

Thais polyxena, S.V.—Occurs commonly round Buda-Pest, but I was too late for it; however, I secured a good number of larvæ from Adlersberg in June, feeding on *Aristolochia*, of which, out of about two dozen, eighteen pupated, and are now in my possession.

Parnassius mnemosyne, L.—Common, but rather worn, on June 5th, in the forest of Szaár, about seventy kilometres from Buda-Pest.

Pieris napi var. *flavescens*, Stgr.—This is an exceedingly interesting variety, occurring, as far as I could make out, *only* at Mödling, near Vienna.—The spring brood was nothing but a rather pale edition of var. *bryonia*, O., but in July I took some very remarkable female specimens, in which the ground colour was more or less of a rich ochre tint throughout, with the black markings much exaggerated (and very black, not dusky as in *bryonia*), but I took one specimen in which these markings were the same as in the type, though the ochre tint was especially brilliant. The males were all typical.

Colias chrysotheme, Esp.—I made an expedition to Mödling with the Baron von Kalchberg in May last year, hoping to secure this species, but we did not see one. He informed me that it was always much scarcer in the spring brood, and the specimens were smaller and paler. At the end of August I found it common enough in the same locality. It also appears in the neighbourhood of Buda-Pest, larger and finer than the Austrian form, but I was unfortunate in not obtaining one specimen, though Herr Aigner caught three or four on Aug. 7th, in the Kammerwald, one female of which was very large and strongly marked.

C. myrmidone, Esp.—This most charming butterfly occurs in various localities near Buda-Pest. Unlike *C. chrysotheme*, the specimens of the first brood seemed to be the largest and brightest, but the second brood was more abundant. I took it at Csepel-Sziget, Hidég Volgy, and Farkas Volgy. It was a curious fact that in Mehadia I saw no *Colias* except the two common ones, *hyale* and *edusa*.

Thecla betula, L., *T. spini*, Schiff., *T. w-album*, Kn., *T. acacia*, F., *T. quercus*, L. (also var. *bellus*, Gerh., but rarely) and *T. rubi*, L.—All occur in the mountains above Ofen, the local name for Buda.

Polyommatus virgaurea, L.—A remarkably fine form occurred in the Wasserwald, bei Mehadia, in June.

P. thersamon, Esp.—Fairly common on the marsh ground below the Kammerwald, and other localities in the neighbourhood of Buda-Pest, in August, but some of the specimens were rather worn. I also took it near Kavaran Szakul, at the end of July, where it was much more worn; possibly the end of the first brood (?).

P. dispar var. *rutilus*, Wernb.—A very small form of this butterfly was common round Kavaran Szakul at the end of July; near the Kammerwald, in August, most of the specimens were much larger. I also took one male in the forest of Szaâr, in June.

P. alciphron, Rott.—At Isaszegh, about fifty kilometres from Buda-Pest, on June 2nd, in one particular spot on the borders of a wood, I took several very fine male specimens in perfect condition, and a week later, at the same place, the females were also out, but much rarer. This butterfly also occurs in the Oserna Thal, near Herkulesbad, but it was practically over by the time I got there, both this year and last.

Lycæna amanda, Schn.—I took two males on June 14th, at Szép-Juhászué, near Buda-Pest, and Herr Aigner took several others, also males. I did not see a female.

L. meleager, Esp.—This most beautiful butterfly occurs more or less commonly in every locality I visited in Hungary and Austria; the females, however, are rare. The whole of the month of July is its time of appearance, and good specimens are still to be met with in August.

L. iolas, O.—This "monster blue" occurs abundantly in Farkas Völgy the last fortnight in July; but when I was there in August it was quite over; I only saw a few specimens, and they were too much worn to be worth taking. It looks as large as *M. galatea* when on the wing. The larva is to be found in the seed-vessels of *Colutea arborescens*.

L. arion, L.—In Mehadia this is one of the commonest of the "blues"; I also found it at Kavaran-Szakul, where I took one specimen of the var. *obscura*, Frey, but it was not so dark as the Swiss form. I may here add that all the commoner species of this and the preceding genus, such as *P. dorilis* and *phléas*, *L. icarus*, *damon*, *orion*, *argiolus*, *corydon*, &c., also occur throughout Hungary with the usual prolific abundance.

Libythea celtis, Esp.—This is a butterfly that seems to have a very wide range, but never to occur in any abundance. Out of the four specimens I have in my collection, one is from Granada, in Spain; one from Aix-en-Provence, in France; one from Sondrio, in North Italy; and one I took last year at Herkulesbad,—the only one I ever saw there.

Apatura iris, L., *A. ilia*, S.V., and var. *clytie*, S.V.—Any entomologist desirous of seeing the *Apatura* reigning supreme must visit the Rohrwald, near Spillern, about twenty kilometres from Vienna, the first fortnight in July. I shall never forget what a sight it was; the pathways through that magnificent forest were literally swarming with butterflies of this genus, *clytie* being by far the most numerous, while the typical *ilia* was comparatively rare. Upon making enquiries of a local entomologist I chanced to meet, he assured me that this profusion of insect life occurred invariably the same at this season of the year,

which seemed all the more remarkable, as the depredations made upon such large conspicuous butterflies were incessant; every peasant-boy was armed with a net of some sort, and I actually saw one lad with his hat decorated lavishly and wastefully with as many of these glorious insects as, with folded wings, he was able to cram together; that boy alone must at least have secured some thirty specimens. I could only suppose that the reason extermination does not result from such wanton sacrifice was owing to the fact that all these swarms were entirely males. I left Vienna before the females were out, and later on, early in August, upon revisiting the Rohrwald, not a single individual of all that gay throng was left; the forest-paths were quite deserted, and sadly enough did I miss the flutter of their wings and the exciting influence of their beautiful presence. The *Apatura* also occur, but much more sparingly, in the Mehadia district.

Limnitis populi, L.—Occurs, but not commonly, in various localities, in both countries. The only specimen I ever saw was in the Rohrwald, in July, and that was in the box of another collector.

L. camilla, S.V.—One fine male specimen on the Alionberg at Orsova this year, in July. I observed no others anywhere, except one female (damaged) near Herkulesbad in June.

L. sibylla, L.—Common in June and July in almost every locality I visited in either country.

Neptis lucilla, S.V.—Common in the park at Schönbrunn, near Vienna, in June, and in the forests round Herkulesbad in June and July.

N. aceris, Lepsch.—There is something very weird and sad about the flight of this graceful little butterfly, with its meteor-like movements, as it glides backwards and forwards against the dark green foliage in the forest glades, which it loves to haunt; and though often ascending far beyond the swoop of the net, it more often comes within easy reach of it, thereby falling a ready prey into the hands of the greedy collector, for, though common enough where it occurs, *aceris* is not met with in Europe except in the far East. I found the second brood emerging towards the end of July last year, near Herkulesbad, where it soon became extremely common. This year, however, individuals of the second brood began to emerge in quite the beginning of July, and were more or less worn *before* the period when I had found them fresh the year before. Is it possible that *aceris* produces three broods in the course of the summer? I did not come across it farther west than Kavarán-Szukul, where it was also extremely abundant.

Vanessa levana, L., and var. *prorsa*.—Occurs near Vienna and in some parts of Hungary, but always in my experience very sparingly.

V. polychloros, L.—In a wood near Orsova, in June, I found numbers of this insect flying round the young elm-trees and settling on their trunks, and as far as I could make out they were all exclusively *polychloros* and—nothing else!

V. xanthomelas, S.V.—I only succeeded in taking one specimen of this rare butterfly this year, in June, in the Cserna Thal, near Herkulesbad, which I had been told was a locality in which it was occasionally taken.

V. vau-album, S.V.—Also only one specimen, at Rodaun, near Vienna, on July 9th, 1897. It was flying over a manure-heap on the

outskirts of a wood, and I believe I saw one or two others flying high up on oak-trees the same day. But when I again visited the locality in August all signs of it had disappeared.

Melitæa maturna, L.—Fairly common in a limited range, at one part in the forest of Szaâr, on June 5th, but several of the specimens were already rather worn. Later on, in one of the forests near Herkulesbad, I also found one or two, but these were very much the worse for wear.

M. cinxia, L.—The female specimens at Szaâr were more or less paler in the ground colour, with the black markings very broad and distinct, and a strong inclination to olive-green on the basal half of the fore wings.

M. phæbe, Kn.—Always a most variable insect; occurring in every locality I visited. In the Cserna Thal the females had the ground colour extremely pale in parts, and the black markings very broad.

M. trivia, S.V.—This year, for the first time, I became personally acquainted with this little butterfly, by no means one of the least difficult of the *Melitæa* to distinguish and classify, as it varies very considerably both in size and colour. In the forest of Szaâr, in June, I took a male of medium size, of which the ground colour in parts was very pale. At the top of a high mountain called Hunka-Kamena, on the frontier between Hungary and Roumania, I again came across *trivia*, but so sparingly that I only succeeded in netting two specimens, one of which was a female of such huge dimensions, and so darkly marked, that had I been at Sarepta, in Russia, I should have considered that I had taken the var. *fascelis*, Esp. But at Farkas-Volgy, &c., near Buda-Pest, in August, this species puzzled me yet more; some of the specimens were exceedingly small (I suppose, var. *nana*, Stgr.), the fulvous varying in tone, and many were scarcely distinguishable from *M. didyma* var. *occidentalis*, Stgr., which occurred at the same time and place.

M. didyma, O.—This is, I suppose, about the most variable of all the *Melitæa*. Near Orsova, in June, the females appeared all to be of the var. *meridionalis*, Stgr.; also occasionally at Herkulesbad, some fifteen miles away, but much less markedly so. The var. *occidentalis* occurred with the var. *alpina* at Farkas-Volgy in August, the former often being extremely difficult to distinguish from *M. trivia*, though some of the specimens were quite distinct.

M. dictynna, Esp.—Common in the forest of Szaâr in June.

M. athalia, Rott.—A large, strongly-marked variety, called *mehadensis*, is said to occur at Mehadia, but I did not come across anything but the type.

M. aurelia, Nick.—At Peszér, near Buda-Pest, in June.

Argynnis selene, S.V.—Fairly common in June; also *euphrosyne*, L.

A. dia, L.—Common throughout Hungary and Austria.

A. daphne, S.V.—Common at Herkulesbad in June and July.

A. hecate, Esp.—In the neighbourhood of Buda-Pest in June. I

did not observe it anywhere else.

A. latonia, L., *aglaia*, L., *niobe* var. *eris*, Meig., *adippe* var. *cleodoxa*, O., and *paphia*, L., are all to be found in both countries.

A. pandora, S.V.—Occurs in the Cserna Thal. I saw a few speci.

mens, damaged, last year in July; and took one very fine male this year in June, but saw no others.

Melanargia galatea, L.—Occurs commonly in Hungary and Austria; var. *leucomelas*, Esp., occasionally with the type; and from the Domoglet, near Herkulesbad. I have some very black examples of the var. *procida*, Hbst. One female I took there last year is *procida* above and *leucomelas* beneath.

M. japygia var. *sucarovius*, Hbst.—It was to take this interesting variety that caused me to visit Buda-Pest, as I had heard on good authority that the only known locality in the whole of Hungary where it occurred was a wood at Peszér in that neighbourhood. Therefore at every Friday evening gathering of the Buda-Pest entomologists I would enquire anxiously if the *sucarovius* was yet on the wing; and, after a week or ten days, at last a day was fixed to make the great expedition to Peszér, which from all accounts appeared to be about the most inaccessible place imaginable. On the 12th of June, beneath a brilliant sky, we started in the early morning from Buda-Pest, a party of five in all, Herr Aigner acting as guide, as he alone had previously visited this wonderful spot. About two hours in a slow train brought us to Dábás; but there our hardships were to begin. Herr Aigner secured a cart at the station drawn by two little Hungarian horses—a sort of miniature hay wagon it seemed to me; and the first jog along the road to the village of Dábás was enough to show us that it was entirely innocent of springs. The way was long; and to say that the road was bad would be to give but a faint idea of the tract of country over which we travelled in our springless vehicle; the sand was so deep in many places that the wheels sank in up to the axle; but the horses seemed quite accustomed to it, and did their work well. The farther we went the worse it got; and, by and by, we left the so-called road and seemed to be pursuing a half-beaten track across the open grass land; twice the way lay through great sheets of water, in one of which we stuck in the mud, and I thought nothing could save us from being upset; but no one else seemed to think anything of it, so I concluded that this too was part of the play! We were now quite in the wilds of Hungary; at intervals we passed through immense herds of long-horned cattle; but human life seemed to be but thinly represented. I could not but admit that Herr Aigner was right when he had told me that the way from Dábás to Peszér would have been absolutely impracticable for a bicycle. I really began to think we should never get there; it was more than two hours since we had started from Dábás, and still we were bumping and jolting along, stiff and tired even before reaching the scene of action. But, whatever the hardships and risks of the way had been, they were more than compensated for when we did arrive. It was indeed an entomologist's dream realized, when we alighted, to find ourselves in a forest literally abounding with butterflies, and where the *sucarovius* was the most conspicuous of all; it was flying by hundreds—a white, graceful creature—in all the grassy glades of this wonderful forest, and nearly all in perfect condition. The females were especially beautiful, the under side of the hind wings and apex of the fore wings being broadly suffused with a deep primrose tint. Knowing that I should probably not find myself in this world-forsaken spot again, I secured all my box would hold, and only regretted that I had not brought two boxes.

Eighteen males and fifteen females were the results of my captures; and then I began to awaken to the fact that other treasures were also to be had in the woods near Peszér. *A. hecate* was flying everywhere, and in perfect condition; but it was a little early for the females, of which I only took one, a splendid specimen, very darkly marked. *M. aurelia*, *A. daphne*, *P. alciphron*, and *C. morpheus*, with many other butterflies, if common in other places, literally swarmed here; if rare in other localities, in this favoured spot they were abundant. We stayed on till late in the afternoon, and the long, glorious day was beginning to wane at last. All were satisfied, and I was delighted, with the success of the expedition. It is worth the long journey from England to Hungary, if only to pay a visit to Peszér in June, especially in the society of so many congenial companions and kindred spirits.

Erebia medusa, S. V.—Common, but worn, at Szaár in June.

E. melas, Hbst.—The last fortnight in July and the first in August is the time to find *melas* on the Domoglet near Herkulesbad. I first saw it on the wing on July 21st, 1897, though Golopenza (my guide) had brought me in one male specimen of it amongst a quantity of *athlops* a few days prior to that day. It was very common where it occurred, but the ground over which it flew at the top of the mountain was so thickly strewn with huge rocks and boulders that the chase was both arduous and difficult; the females, too, who were much rarer than the males, were also more difficult to catch. From time to time I would see one driven by the wind, fly some ten or twenty yards, and then alight on a rock, taking to flight again the moment I approached, no matter how cautiously, and (what was curious) they were often damaged, whereas the males were in excellent condition. A week or two later they seemed to come down to a lower altitude, and more than once I observed male specimens as far down as the rocky pathway just below the Kreuz, but never lower. This year I left before *melas* was out, for though I made many expeditions to Domoglet I did not observe so much as one example of the species.

E. athlops, Esp.—Extremely common in all the woods and forests round Herkulesbad in July.

E. ligea, L.—Occurring in the Domoglet and elsewhere; a fine, large form. I saw no *euryale* in that neighbourhood at all.

Satyrus hermione, L.—Common in July in most localities in Hungary.

S. alcyone, S. V.—All the specimens I took at Baden and Mödling near Vienna in August last year seemed distinctly to belong to this and not to the preceding species.

S. circe, F.—Fairly distributed in Hungary and Austria.

S. briseis, L.—This species seemed to be the commonest of the genus. Last year at Mödling it was very common in August; and this year in that same month it occurred in great abundance in most of the localities in the neighbourhood of Buda-Pest, Farkas-Volgy particularly.

S. semele, L.—Very common everywhere.

S. arethusa, S. V.—Very common in the neighbourhoods of Vienna and Buda-Pest in August.

S. statilius, Hufn.—When I left Hungary towards the middle of August *statilius* had not yet appeared; but about a week or ten days

later Herr Török very kindly sent me a good series (males only) in excellent condition, which he had taken at Csepel-Sziget, near Buda-Pest.

Pararge roxelana, Cr.—This rare and interesting butterfly occurs not uncommonly in the forests round Herkulesbad and Orsova. Last year I was too late to secure fresh specimens, more especially as I had been two weeks in the neighbourhood before I discovered it. In fact, it was already the 27th of July when I made a dash at a good-sized brown butterfly near the white "Kreuz," on my way down from the Domoglet, and found it to be a male specimen, much worn and broken, of *roxelana*; and I afterwards found that it inhabited the forest below the Kreuz; but none of the males were fresh, and the females were so rare that I only succeeded in obtaining two examples, though both were in excellent condition. This year, however, I determined to be in time for it; and on June 23rd, in a wood above Orsova, I secured four males, though I soon found that the Kreuz wood above Herkulesbad was far the best locality for it. It is a difficult butterfly to catch, as it has a habit of flying high and settling out of reach of the net. The best plan (suggested to me by Herr Bourdon) is to mount guard near an old oak tree which has the bark discoloured by a sort of dry resin on which this butterfly feeds with great avidity, and by this means many fine specimens may be secured. The afternoon is better than the morning, as then it seems more inclined to descend from the trees.

P. clymene, Esp.—If *roxelana* is difficult, *clymene* is ten times more so. It seems to occur only at a considerable elevation, though I did once take one specimen on the road going down to Herkulesbad Station, but this I think was only chance, for there was a strong wind blowing that day, and it must merely have been blown down from the mountains. Except this one solitary exception, *clymene*, as far as I could discover, seemed to be confined to one locality, *i.e.* the forests in the immediate vicinity of the Domoglet. Last year I was too late for it on the 21st of July, though males were common enough in this spot; they were nearly all damaged and worn; and this year it occurred very much more sparingly; besides, I was unlucky in the weather on an expedition I made on July 6th; the clouds rolled up from the valleys, and there was no more sunshine after 9 a.m., so I had to be satisfied with only one fine specimen for that day. On July 11th I again visited this interesting mountain, and saw a magnificent female (the only female I did see), but to my great sorrow she escaped me. Two days later I was there again, but the males were already getting worn, and were far from plentiful. I imagine they last but a very short time in good condition, probably owing to the fogs, and especially the winds which at so great an elevation are almost incessant.

P. hiera, F.—In the woods near Mödling in the beginning of May; and at Hidég-Volgy, &c., near Buda-Pest, early in August. At Herkulesbad I only observed *mæra*. *Megara* and *egeria* were also common in most places.

P. achine, Sc.—A very fine form was abundant in the woods at Szép-Juhászué, near Buda-Pest, in the middle of June, but they were all males. Herr Aigner said the female was always rare.

Epinephele lycaon, Rott.—At Isaszegh in June; and again in July and August at Csepel-Sziget; also at Farkas-Volgy, where I took a

female with the left fore wing possessing the characteristics of the male.

E. ianira, L.—Common everywhere.

E. tithonus, L.—Common on the Alionberg at Orsova, and at Kavarán-Szakul. I never saw it anywhere else.

E. hyperanthus, L.—Last year in the Cserna Thal in July I took a male with the rings on the under side abnormally large and distinct; and this year in June at the very same spot I took another male, in which this feature was even more strikingly developed.

Cænonympha ædipus, F.—Occurs in the neighbourhood of Buda-Pest, but I did not come across it.

C. iphis, S. V., and *C. pamphilus*, L.—Both common in Hungary and Austria.

Spilothyrus lavateræ, Esp.—Literally swarms at Csepel and other places near Buda-Pest in July; but I was practically too late for it when I returned there this year, and I did not see or hear of it in the Mehadia district.

Syrichthus carthami, Hüb., *S. alveus*, Hüb., and *S. malva*, L.—I do not think I am wrong in stating that these and other species of *Syrichthus* are all to be met with in Hungary and Austria.

S. orbifer, Hüb.—Occurs in the neighbourhood of Buda-Pest in August. I never took one myself; but Herr Török presented me with two males, in excellent condition, he caught one day when we were collecting together at Farkas-Volgy.

Nisoniades tages, L.—Occurs commonly in both countries.

Hesperia thauwas, Hufn., *H. lineola*, O., *H. sylvanus*, Esp., and *H. comma*, L.—All occurred commonly; but I did not see or hear anything of *H. actæon*, Esp., or *H. nostradamus*, F.

Cyclopides morpheus, Pall.—Was common in the marshy meadows on the borders of the Rohrwald in June and July; also at Weidlingbach near Vienna. I do not recollect observing it anywhere in Hungary, except in the celebrated woods near Peszér.

Carterocephalus palæmon, Pall.—Occurring, but not at all commonly, in the Rohrwald in the beginning of May.

NOTE.—A fresh male specimen of *Melitæa didyma* var. *occidentalis* that I took in North Italy, in August last, has the typical red replaced by rich cream colour.

It now only remains for me to add that the pleasure and success of my expeditions was so greatly enhanced by certain members of the Buda-Pest Entomological Society, that I hope anyone thinking of visiting that place will allow me to have the pleasure of introducing my countryman amongst them, when, I think, I am not wrong in assuring him that he will meet with a warm and hearty welcome. And I should also like to take the opportunity of recommending anyone visiting the Mehadia district to solicit the services as guide of Marien Golopenza, of Pesinesca, a Roumanian peasant of intelligence, and some knowledge of the fauna of his neighbourhood; also able to speak German quite sufficiently well to make himself intelligible.

7, Lansdown Place (East), Bath: November, 1898.

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NOTES AND OBSERVATIONS.

SPHERIA LARVARUM, Westw.—I have just seen the interesting notes on *Sphæria larvarum*, by Messrs. George Howes and W. W. Smith, in the 'Entomologist' of June last (*ante*, pp. 128–130). There appears to have been some question as to the liability of wood-boring larvæ to attack from the fungus. As bearing on this point I may mention that I have on several occasions found larvæ of our large wood-boring hepialid, *Phassus purpurascens*, destroyed by this or an allied fungus. In each case my attention was attracted by the appearance of the clavate extremity of the fungus at the opening of the gallery. The stalk extended some six to eight inches down the tunnel, and terminated in the head of the dead larva, whose body was completely filled and extended by the mycelium. To the best of my belief, the larvæ of *Phassus* never leave their tunnels in the tree, so the spores of the fungus must get washed down to them. Their galleries are usually vertical, running down the very centre of the stem, with a lateral aperture at the upper extremity, through which the frass is ejected. This frass does not fall to the ground, but is woven into a thick felt-like curtain, that screens the entrance to the tunnel. The *Phassus* larvæ affect the following trees in this neighbourhood:—*Trema orientalis*, *Cinchona robusta*, *Callicarpa lanata*, and a species of *Rubus*.—E. ERNEST GREEN; Eton, Pundaluoya, Ceylon, October 14th, 1898.

AMPHIDASY BETULARIA (Linn.) VAR. *DOUBLEDAYARIA* (Mill.) IN LONDON.—It is interesting to note of late how this variety has become spread over the London districts, and it seems by the notices that the captures have been mostly individual ones, so perhaps the following may be interesting. *A. betularia* has been very common here this season, and maintained its popularity to the end. But the first appearance of *doubledayaria* was not till June 28th, when I took a light melanic male. At first I thought it had been robbed of its pigment, but afterwards found I was mistaken. The next visit to light was July 2nd, when I found another specimen on the ground, losing one the same evening. The cold and windy nights made captures difficult except to the bats. It was not until August 4th or 5th that this variety again came to light, making a total of six specimens, including two found by a boy. I had reason when collecting to note that the majority of the specimens attracted by light were males, and also that this sex showed less tendency to vary than the females.—H. W. BELL-MARLEY; Ravenscourt Park, W., October 28th, 1898.

LYCÆNA LYCIDAS.—In reference to the note on *Lycæna lycidas* (*ante*, p. 260), I should like to mention that I took this insect in the valley in which St. Nicholas lies as long ago as 1886, and it had also been taken there a year or two previously. In the same year I took two specimens of it high up on the Gemmi Pass, which Dr. Staudinger, to whom I showed them, pronounced to be an entirely new locality, but I have not heard of their occurrence there since.—R. S. STANDEN; Thorpe Hall, Colchester, November 2nd, 1898.

ELECTRIC LIGHT *versus* GAS LIGHT (INCANDESCENT).—Considering what numbers of insects are attracted by the electric light in our streets, I have often wondered why the incandescent gas lights appear to be less attractive than the lamps with ordinary burners, although the former light is so much more brilliant. Since the installation of the electric light at Shepherd's Bush, I have noticed moths gyrating around the lamps in scores, indeed, sometimes it has been almost bewildering to look up at the whirl of fascinated insects. I still find that the old gas-lamps attract a few specimens, but I rarely notice any tenants on the lamps with the mantle light. I was glad to note that *Eugonia fuscantaria* still occurs in the neighbourhood, as I picked up a fine female which had been smashed by a passing cyclist. I noticed that many moths rest on the roadway for a while, and often renew their giddy flight round the arc-light, the attractive power of which appears to them irresistible.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury, W., October 21st, 1898.

THE PUPATION OF *SMERINTHUS TILIÆ*.—It has been a matter of speculation as to where the larvæ of certain insects, such as *Smerinthus tiliæ*, pupate when the base of the tree, generally an elm, the foliage of which forms its principal food, is wanting in those warm cosy angles clothed with grass. The ground surrounding these trees is often made so hard by cattle as to defy any larvæ penetrating it. Some time since, whilst examining one of these trees, my attention was attracted by a large quantity of loose bark which hung from the trunk like huge scales. On climbing up the tree some ten or twelve feet and loosening the bark, I was surprised to find two or three pupæ of *S. tiliæ* beneath it; the larvæ had fastened themselves to the bark, which acted as a perfect shelter from wind and storm. During the past two months I have dug under some hundreds of elms, which grow to great perfection in the valley of the Tone, and it is singular that I have never met with more than one pupa of this insect beneath any one tree; perhaps this is accounted for by the foregoing remarks. In the case of *Smerinthus populi*, I have found as many as three beneath one poplar, the bark of which would not allow of the pupation of such large larvæ beneath it.—T. BUCKLAND; East Street, Taunton, November 8th, 1898.

GRASSHOPPERS AT SUGAR.—Mr. Lucas's account of *Thamnotrizon cinereus*, Linn., being taken at sugar is of some interest (*ante*, p. 267). It is a well-known fact that these Dectidæ are fierce carnivorous insects, and equally well known that they are, partly at least, nocturnal in habits. It would be very interesting to observe whether *T. cinereus* comes to sugar for the sake of the insects which the sugar attracts, or to partake of the delicacy itself. *Meconema varium*, Fab., is not carnivorous, but I doubt whether *T. cinereus* would attack so large an insect. It usually prefers small flies, *Musca*, &c. As to its nocturnal propensities, I have often taken it in hedges, chirping away merrily, between ten and twelve at night in August and September, in the south of England.—MALCOLM BURR; New College, Oxford, October 29th, 1898.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA IN SUSSEX.—On Oct. 23rd, whilst walking on the marsh here, I saw a fine male *C. edusa* flying in front of me. It was the first I had noticed this season, and I captured it with my hat, after several attempts. —J. T. DEWEY; 26, Willingdon Road, Eastbourne, Oct. 23rd, 1898.

COLIAS EDUSA AT CHICHESTER.—This species has straggled on here late into the season. A fine male was taken on Oct. 28th. It flew out of the box whilst I was chloroforming it, and was lost in the room. I searched for it everywhere for some time without success. It may have been accidental, but I am disposed to believe it an instance of the power of selection on the part of insects of protective coloration. Quite by chance I discovered the insect on a cloth, hanging from a table, of maroon ground with leaves of old-gold colour. On one of these leaves the butterfly was settled, with closed wings, showing the under sides, which harmonized exactly with the yellow of the leaf. —JOSEPH ANDERSON; Chichester.

XYLINA SEMIBRUNNEA AT CHICHESTER.—I took a splendid specimen of *X. semibrunnea* at sugar on Oct. 10th. —JOSEPH ANDERSON; Chichester.

CREAM-COLOURED PIERIS RAPÆ AT CHICHESTER.—A female *P. rapæ*, apparently freshly emerged, was taken at Apuldrum on Oct. 10th. It is of a buff or cream-colour, quite as deep in shade as specimens in my cabinet from Scotland and Ireland. —JOSEPH ANDERSON; Chichester.

DEILEPHILA LIVORNICA IN SURREY.—On Oct. 15th a specimen of *D. livornica* was taken by our servants here; it came into the house over-night and was captured in the morning. I suppose this is a rarity? —(Rev.) C. D. SNELL; Duncroft, Kenley, Surrey, Oct. 31st, 1898.

PLUSIA MONETA IN SURREY.—We took a specimen of *P. moneta* here in the summer. Unfortunately it got into the gas and was much damaged. —(Rev.) C. D. SNELL; Duncroft, Kenley, Surrey, Nov. 3rd, 1898.

SPHINX CONVULVULI, ACRONYCTA ALNI, &c., IN WORCESTERSHIRE.—On Oct. 4th last a fine example of the former insect was brought to me; it was found on some palings at Moseley. Last spring I bred an example of *alni* from a pupa found among some wood of rotten palings at Hall Green. Near Knowle I found a pupa which turned out *Amphidasys betularia* var. *doubledayaria* (male), which, however, was malformed. I also met with, during the summer, for the first time near Moseley, *Pterostoma palpina* and *Cucullia umbratica*. —A. D. IMMS; "Linthurst," Oxford Road, Moseley, Worces.

DEILEPHILA LIVORNICA, SPHINX CONVULVULI, &c., AT PORTLAND, 1898.—Of my captures here this year the following are, doubtless, worth putting on record:—*Deilephila livornica*, one taken in my garden whilst hovering over *Silene pendula compacta*, about 9 p.m., on June 12th, in very good condition. *Sphinx convolvuli*, fifty-two taken between Aug. 4th and Oct. 3rd. On the evening of Sept. 17th at least a dozen, I believe, were hovering at one time over a bed of petunias, eight of which I secured. *Macroglossa stellatarum*, plentiful from Aug. 20th till the end of September; about fifty taken. *Helio-phobus hispidus*, one hundred and two taken between Aug. 25th and Sept. 27th, on grass and at light. *Aporophyla australis*, twenty-six taken at sugar and light during September.

Vanessa c-album, one taken at sugar in the daytime, on Sept. 17th. The whole of these were caught within fifty yards of my residence, and each species in a very limited area; for instance, the first nine specimens of *S. convolvuli* were captured in a space not exceeding a cubic yard, and *H. hispidus* occurred most plentifully in a portion of a bank measuring about twenty yards by two.—J. T. HYDE; The Grove, Portland.

COLIAS EDUSA IN SUSSEX.—On Tuesday, the 1st inst., a bright sunny day, I saw flying over a bank on the Sea Road, Bexhill, a specimen of the above species. It did not look at all battered, and it settled on the bank, where I had a good view of it.—GWENDALINE MATHEW; Bexhill-on-Sea, Nov. 12th, 1898.

XANTHIA GILVAGO, &c., IN LONDON DISTRICT.—I took three specimens of *X. gilvago* on the incandescent lamps at Roehampton in September. Two were in excellent condition, but the third was rather worn. Amongst the other things taken on the lamps was a moth very like *X. gilvago*, and which from Mr. Tutt's description must be *X. ocellaris*.—G. K. GREGSON; Ardkeen Lodge, Putney, Nov. 12th, 1898.

PHLOGOPHORA METICULOSA IN NOVEMBER.—Mr. E. Hill, of Kingston-on-Thames, and Mr. F. M. B. Carr, of Lee, each note the occurrence of a specimen of *P. meticulosa* about the middle of November last, and the latter asks, "Is not this rather a late date for this species?" It is perhaps unusually but not exceptionally late, as a specimen was taken at Putney on December 26th, 1895 (*Entom.* xix. 65); and Mr. Armstrong tells me that he saw one on the last day of the year 1872, at Sandown Park.—RICHARD SOUTH, 100, Ritherdon Road, Upper Tooting, S.W.

UROPTERYX SAMBUCARIA IN NOVEMBER.—Is it not very unusual for *U. sambucaria* to appear in the perfect state in November? I bred some of the larvæ of this species (this summer) from eggs laid on the crack willow. Instead of hybernating as usual, two of the larvæ became pupæ in October, and from one of these an imago emerged on Nov. 8th.—ALBERT MAY; Chandos, Hayling Island, Hants, Nov. 18th, 1898.

[In 1896 a specimen of *U. sambucaria* was taken at light on Oct. 2nd, and another example was captured in a garden on the 8th of the same month (*vide Entom.* xxix. 334 and 371).—ED.]

APLECTA PRASINA IN NOVEMBER.—On November 2nd an imago of *A. prasina*, F. (*herbida*, Hb.), emerged in one of my breeding-cages. This was the more striking as in neighbouring cages I have a large brood of larvæ of the same species reared from eggs laid in June, which are now half-grown and commencing to hibernate. The larva which has just resulted in an imago was found in the same locality as the moth which produced the eggs, but a couple of months later.—(Rev.) W. G. WHITTINGHAM; South Wigston Vicarage, Leicester.

ABERRATION OF *EPINEPHELE TITHONUS*.—I wish to record the capture, in August, on Portsdown Hill, South Hants, of a specimen of *E. tithonus* in which the usual red-brown ground colour of the wings is replaced by pale yellow. I ought to say, perhaps, that this is not a faded or damaged "ordinary" specimen; the outlines of the markings are particularly sharp and well-defined and the colouring quite decided, the latter giving the insect a rather striking appearance when on the wing. I should like to know if

this variation is a common one, since I captured a similar one last year in exactly the same spot.—G. M. RUSSELL; 14, Plough and Harrow Road, Edgbaston, Birmingham.

[Judging from our correspondent's description, the variety of *E. tithonus* referred to appears to be somewhat similar in character to that figured and described in the 'Entomologist' for 1897 (xxx. p. 253).—ED.]

CAPTURES AT STREET-LAMPS. — Lepidoptera appear to have been unusually scarce this year in this district, and sugaring more or less of a failure. I made several expeditions to Crabbe Wood, but, with the exception of one night, my efforts met with such very indifferent success that I abandoned it and directed my attention to the street-lamps just outside the town. I practically restricted myself to three lamps, though nine-tenths of my captures were made round one, which was in a most favourable situation; and these lamps I worked every night regularly, with very fair success considering the poorness of the season. Nor was I alone in my nightly rounds. Every night, with the most wonderful regularity, I found waiting for me, outside the gate, a sleek yellow-and-white cat, eagerly expectant, in anticipation of the fat juicy beetles which she knew would fall to her share! And if I failed to keep her supplied, which I sometimes forgot to do in the excitement of a capture, which in my eyes was far more important, she would remind me with a loud mew; neither did she give me any peace until I made amends for my shortcomings by throwing her down one of the cockchafers which were swarming round the lamp. She played with it for a few moments, and then it disappeared with an ominous crunch, and there was a clamour for more of the dainty morsels. Curiously enough, when I was at Oxford, there was a cat which used to follow me round in the same way; I wonder if any other "lamp-workers" have had a similar experience. But "revenons à nos moutons." I was surprised to find so many Sphingidæ coming to light, for, besides plenty of *S. populi*, I took single specimens of *S. ligustri*, *S. convolvuli*, *S. ocellatus*, *S. tiliæ*, *C. elpénor* and *C. porcellus*. The following I found in fair numbers:—*N. saponaria*, *H. genistæ*, *G. papilionaria*, *A. corticea*, *A. cinerea*, *P. bajularia*, *H. thymiaris*, *A. imitata*, *T. amatoria*, *E. venosata*, *M. galiata*, *A. rubidata*, *X. subultrix*, *D. conspersa*, *D. carpophaga*, *A. luctuosa*, and *N. senex*. I also took *A. ophiogramma* (2), *A. subsericeata*, *C. quadrifasciaria* (2), *L. viretata* (2), *M. furva* (2), *N. dromedarius* (1), *M. furuncula*, *H. chenopodii* (1), *L. straminea* (2), *Aventia flexula* (1), *E. sobrinata* (1), *E. satyrata* (1), *E. minutata* (2), *E. constrictata* (3), *E. isogrammata*, *H. dipsaceus* (1), *C. furcula* (1), *D. cucubali* (2), *E. lutulenta* (2), *A. suffusa* (1), *A. porphyrea* (1), *B. roboraria* (1), *N. mundana* (1), *C. miniata* (2), *L. aureola* (2); besides many other commoner species. Quite the commonest insects seem to have been *N. festiva*, *E. centaureata*, *O. pudibunda*, *G. trilinea* (I found no less than seventy-eight of the latter on one patch of sugar), *R. tenebrosa*, *H. dentina*, and *E. jacobææ* (which simply swarmed). I took one lovely var. of the latter, in which the usual red marking on all the wings was replaced by a delicate cream, with the faintest suspicion of pink, while the usual dark area of the primaries was of a pale slate-colour; it was in perfect condition, and appeared freshly emerged. I must not omit two fine *E. fuscantaria*, which I took early in October.—H. W. SHEPHEARD-WALWYN; West Downs, Winchester.

TREACLE IN SEPTEMBER AND OCTOBER, 1898.—My father and I paid several visits to a wood in the neighbourhood of Bexley, Kent, for the first

time this year, and had some success at treacle. Sept. 14th was our first visit. *Cymatophora diluta* came to the treacle in great abundance and in fine condition. In addition to this insect, *Phlogophora meticulosa*, *Catocala nupta*, *Amphipyra pyramidea*, *A. tragopogonis*, *Xanthia cerago*, *Anchocelis litura*, *Triphana pronuba*, *T. fimbria*, *Gonoptera libatrix*, *Noctua xanthographa*, and *Hadena proteus* put in an appearance. Sept. 18th (our second visit), we had a most successful evening, taking two magnificent specimens of *Xanthia aurago*, and also one or more specimens each of *X. cerago*, *X. ferruginea*, *Hadena proteus*, *Agrotis saucia*, *A. corticea*, *Noctua c-nigrum*, *Scopelosoma satellitia*, and *Thera juniperata*. *Phlogophora meticulosa*, *Anchocelis litura*, and *A. pistacina* were swarming. Sept. 21st, we took *Xanthia cerago*, *Hadena proteus*, *Hydræcia micacea*, *Cerastis vaccinii*, and *Caradrina cubicularis*, *Phlogophora meticulosa* and *Anchocelis pistacina*. We obtained a most varied series of the last-named insect, which was a perfect pest. Sept. 25th, *Xanthia ferruginea*, *Hadena proteus*, *Agrotis suffusa*, and *A. pistacina*; the latter was abundant. The moon now begun to interfere with the sport. Oct. 2nd, *Miselia oxyacanthæ* (1), *Cerastis vaccinii* (8), *A. pistacina*, and *P. meticulosa*, most abundant. Moon appeared about 6.45 p.m., and the treacle was almost immediately deserted, except for a few *P. meticulosa*. Oct. 9th, beat a rather worn *Xanthia aurago* from an oak at Shoreham, Kent, and obtained two specimens of *Miselia oxyacanthæ*. Oct. 16th, treaced on a sopping wet night in Birchwood, Kent. We counted 125 *Cerastis vaccinii* on about twenty trees, and obtained one example each of *Caradrina cubicularis*, *Anchocelis rufina*, and *Scopelosoma satellitia*, together with several *Cerastis ligula* = *spadicea*.—F. M. B. CARR; 46, Handen Road, Lee.

COLLECTING IN THE NEW FOREST.—My father and I paid a short visit to the New Forest this year (July 16th to 27th). We had splendid weather, and very fair sport. We were very disappointed in the "treacling," which was an utter failure. During the time we were there we saw one example each of *Acronycta rumicis*, *Aplecta nebulosa*, and *Calymnia trapezina* only at the sweets; whereas last year, besides about fifteen specimens of *Catocala promissa* and *C. sponsa*, and two examples of *Triphana subsequa*, we took a number of other insects, and did not have one fruitless night. The time of year was the same, and we treaced the same trees both years. From a local dealer we learnt that everyone in the forest was experiencing much the same luck as ourselves. However, we did fairly well with larvæ, taking *Notodonta trepida* (one full grown and two about three-quarters grown), *N. chaonia*, *Lophopteryx* (*Notodonta*) *camelina*, *Acronycta leporina* (one on alder), *Demas coryli*, *Psilura* (*Liparis*) *monacha* (full grown), *Saturnia carpinii*, *Dasychira* (*Orgyia*) *pubibunda* (very small), *Amphidasys prodromaria*, *Anarta myrtilli* (abundant, all sizes), *Asphalia ridens*, *Panolis* (*Trachea*) *piniperda*, several *Corycia temerata*, *Fidonia piniaria*, *Thera obeliscata*, *Bombyx rubi*, and a number of geometers.

The following insects came indoors to light:—*Pseudoterpna cytisaria*, *Macaria notata*, *Hemithea thymiaria*, *Selenia bilunaria* (*ilunaria*), *Cidaria dotata*, *Dropteryx sambucaria*, *Iodis vernaria* (splendid condition, one only), *Boarmia rhomboidaria*, *Cidaria fulvata*, *Arctia caia*, *Spilosoma menthastri*, *Bryophila perla*, *Leucania pallens*, *Noctua xanthographa*, *Agrotis porphyrea* (most commonly), *Caradrina alsines*, *Plusia gamma*, *Apamea oculea*, *Xylophasia polyodon*, and *Leucania conigera*.

Of the *Rhopalocera*, *Argynnis paphia*, though abundant, was not in such abundance as in 1897. We took two *Valesina*. *Limenitis sibylla* (very

abundant and in much better condition than at the same time last year), *Thecla quercus* (extremely scarce, in 1897 abundant), *Gonopteryx rhamni* (appeared on July 24th), *Argynnis adippe* (fairly plentiful, and in fine condition), *A. aglaia* (not so plentiful or so good as the last), *Satyrus semele* (abundant), *Pararge egeria* (swarming in 1897; this year we did not see one), *Melanargia galatea* (found in one field only, but was fairly plentiful and in splendid condition there), *Lycæna ægon* (most abundant).

Of the moths, *Lithosia griseola*, and especially the variety *stramineola*, was very plentiful. July 23rd we took a fine *L. complana* on some bracken, *Calligenia miniata* (very abundant), and we also took *Lithosia helveola*, *L. mesomella*, and *L. quadra*, *Euthemonia russula* (two, worn, were seen flying over heath), *Hepialus hectus* (abundant and in splendid condition, flying at dusk), *Psilura monacha* (not nearly so plentiful as in 1897). We took a fine female of *Demas coryli*, beaten from a beech tree. Also, *Metrocampe margaritaria* (abundant and fine), *Ellopia fasciaria* (a few worn specimens), *Cleora glabraria* (worn), and *C. lichenaria* (one only), *Boarmia roboraria* (a fine pair on a beech-trunk), *Amphidasys betularia* (a fine female), *Tephrosia crepuscularia* (one), and *T. extersaria* (one, worn) *Gnophos obscurata* (very abundant indeed on some of the heaths, and obtained by tapping with a stick in furrows at the roots of the heather, when they flew out in great profusion), *Pseudoterpnæ cytisaria* (very fine), *Phorodesma bajularia* (good), *Ephyra trilinearia* (very abundant, by beating beeches), *Hyria auroraria* (flying over heather in the sunshine), *Asthena luteata*, *Eupisteria heparata*, *Acidalia scutellata*, *A. bisetata*, *A. trigeminata*, *A. incanaria*, *A. imitaria*, and *A. aversata*, *Macaria liturata* (abundant in pine woods), *Selidosema plumaria* (by beating heaths, males only), *Fidonia atomaria* and *Bupalus piniaria* (a fine female), *Ligdia adustata*, *Pachy-cnemidia hippocastanaria*, *Larentia didymata*, and *L. pectinaria* (worn), *Emmelesia decolorata*, *Hypsipetes elutata* (very abundant), *Melanthia rubiginata* and *M. albicillata*, *Melanippe unangulata*, *M. rivata*, *M. montanata* and *M. galiata*, *Coremia propugnata*, *Cidaria fulvata* (very abundant on the wing at dusk), *C. dotata*, *Eubolia mensuraria* and *E. palumbaria*, *Tanagra atrata* (*charophyllata*) (flying over bracken in the sun), *Aplecta nebulosa* (tree-trunks), *Hylophila prasinana*, *Heliothis dipsacea* (one, flying over heather in the sun, captured after a most exciting chase), *Anarta myrtili* (plentiful and in fine condition), *Agrotis porphyrea* (very abundant), *Phytometra anea*, *Acronycta psi* (most abundant on pine-trunks), *Thyatira batis* (one at heather, worn), *Cerigo cytherea* (one, fine), *Apamea ocella*, and many others.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

CAPTURES DURING 1898 IN THE GALASHIELS DISTRICT.—My first capture of the year occurred on the evening of Feb. 14th, when by the aid of a light I secured a few males and one female of *Hybernia marginaria* from a whitethorn hedge. On Feb. 20th, *H. leucophaæria* and *Anisopteryx æscularia* were taken at rest on palings. The sallows were out early in March; I worked them on eight different occasions from March 11th to April 23rd, but met with poor success. The following insects were taken:—*Tæniocampa gothica* (the commonest), *T. incerta*, *T. stabilis*, *T. pulverulenta*, and *T. rubricosa*; hibernated specimens of *Calocampa exoleta*, *Scopelosoma satellitia*, and *Cerastis vaccinii* also turned up in excellent condition. On the evening of March 11th *Larentia multistrigaria* was extremely abundant; large numbers of the insect came fluttering to the light I carried when working the sallows. I had no net with me, but managed to bottle a few which alighted on the clothing of a friend who

accompanied me. Next evening I proceeded to the same spot in possession of a net, as I wanted a few more specimens of the insect; but, to my great disappointment, although the evening was milder if anything than the previous one, not a single insect was attracted by the light, nor did I again notice it on any other evening. The males of *Diurnea fagella* were abundant and very variable on oak-trunks during the beginning of April; the females were scarcer, only three or four being seen. On the evenings of April 21st and 23rd larvæ of the following species were taken plentifully from a whitethorn hedge near the town:—*Triphæna ianthina*, *T. fimbria*, *T. orbona*, *Noctua triangulum*, and *N. baia*; also a few *Boarmia repandata*. With the assistance of a lantern these larvæ are easily found after dark, climbing up the almost naked twigs of whitethorn to reach the opening bud. The larvæ of *Chelonia plantaginis* were very scarce this season in the locality where they are usually plentiful enough; although I searched the spot several times during April, I only picked up a very few. Sugaring was tried for the first time this season on May 10th, but resulted in a complete failure: not a single insect turned up. On May 15th—a lovely day—I paid my annual visit to a moor where larvæ of *Orgyia fascelina* occur, and found them in all stages of growth as usual, from about a quarter to nearly full-fed. Several males of *Saturnia carpini* were observed flying in the bright sunshine. From May 21st to 31st I paid several visits to Ellwyn Hill, and collected larvæ of *Scodonia belgaria* and *Bombyx quercus*. I also picked up several cocoons of *Arctia fuliginosa*, and took the following insects on the wing: *Fidonia atomaria*, *Melanippe subtristata*, and *Phytometra ænea*. A very fine lot of *Anarta myrtilli* were also obtained at rest on the top of the heather, several being found in cop. I have tried for some time past to induce the female of this insect to deposit her ova in confinement, but have been completely disappointed every season. I should be very pleased to hear from any entomologist who has had success in this direction. A fine specimen of *Hadena glauca* was taken at rest on heather on June 4th; also on the same day, *Hadena dentina*, *Scodonia belgaria*, and *Hypsipetes impluviata*, the latter at rest on alder trees. A week later, when returning from a very unsuccessful day's collecting on Ellwyn Hill, I observed the males of *Bombyx rubi* flying over the heath abundantly; this was about 6 p.m. I noticed that when struck at with the net they ascended straight up into the air, sometimes so high as to be completely lost sight of. During the latter end of June, dusking along the rides of a wood produced the following insects:—*Rumia crategata*, *Metrocampa margaritata*, *Ellopiæ fasciaria*, *Odontopera bidentata*, *Boarmia repandata*, *Cabera pusaria*, *Fidonia piniaria*, *Larentia pectinitaria*, *Thera simulata*, *T. variata*, *Hypsipetes impluviata*, *Melanthia ocellata*, *Melanippe tristata*, *M. rivata*, *M. subtristata*, *M. montanata*, *Camptogramma bilineata*, *Cidaria suffumata*, *C. silaceata*, *C. fulvata* and *C. pyrallata*, *Eubolia palumbaria*, *Hepialus lupulinus* and *H. humuli*, *Noctua plecta*; and by other methods, *Acronycta psi*, *Hecatera serena*, *Caradrina cubicularis*, *Rusina tenebrosa*, and *Arctia menthastri*. On June 19th a very fine specimen of *Acronycta menyanthidis* was taken at rest on an ash-trunk. By July 2nd *Lycæna astrarche* var. *artaxerxes* was well out, and in company with it were *L. alexis*, *Cænonympha pamphilus*, *Satyrus ianira*, and *S. hyperanthes*. On July 10th I took a good specimen of *Amphidasys betularia* at rest on the ground, and found the remains of another, which had evidently been attacked by a bird, near the same spot. On July 12th one specimen of *Thyatira batis* was taken flying at dusk. Sugaring was again tried on the night of July 13th, but

with poor result, the total take being three *Agrotis exclamationis* and two *Acronycta ligustri*. From July 13th to the end of August sugaring was tried at intervals of four nights—this was along the rides of a wood, composed of all sorts of trees and thick undergrowth; but night after night had the same result—an empty bag. Getting quite exasperated at such profitless work, my friend Mr. Tait, who always accompanies me on sugaring expeditions, suggested the idea of sugaring the posts of a wire-fence which crosses a piece of moorland near the town. This was done several times during the month of August, and was very successful as regards the number of insects which turned up, although they were of the commonest types. The following species were taken:—*Noctua xanthographa* (in great variety), *N. festiva* (also in great variety), *Leucania lithargyria*, *Xylophasia polyodon* and var. *infusata*, *Agrotis porphyrea*, *Charaxes graminis*, and *Triphana pronuba*. *Larentia caesiata* was taken on the wing at dusk. By Aug. 1st *Erebia blandina* was out in plenty in its usual haunts. I notice that the females are always a week behind the males in making their appearance. It was not till the beginning of September that sugaring began to yield well, and from then up till the time of writing the following insects have been taken plentifully by that means:—*Triphana orbona*, *Amphipyra tragopogonis*, *Orthosia macilenta*, *Anchocelis litura*, *Cerastis vaccinii*, *Scopelsooma satellitia*, *Xanthia ferruginea*, *Cosmia trapezina*, *Polia chi*, *Epunda nigra* (over fifty specimens were taken), *Miselia oxyacanthæ*, *Agriopsis aprilina*, *Phlogophora meticulosa*, *Hadena proteus*, *Calocampa exoleta*; also the following: *Hydræcia nictitans* (two), *Miana fasciuncula* (a few), *Agrotis suffusa* (one), *Noctua glaucosa* (three), *Triphana fimbria* (a few), and *Anchocelis litura* (one); and by other means, *Diloba caruleocephala* (one), *Oporabia dilutata*, *Cidaria niata*, and *Chesias spartata*—JAMES C. HAGGART; 29a, St. John's Street, Galashiels, Nov. 1st.

NOTES FROM THE CHESTER DISTRICT.—Butterflies have been comparatively scarce this season, the only common ones being *Pieris rapæ* and *P. napi*. *P. brassicæ* was fairly represented, but local. Dragonflies have also been below the usual number—exceptionally so in the species *Agriion puella* and *Æschna grandis*.

Moths such as *Grammesia trilinea* and *Agrotis exclamationis*, with an occasional *Thyatira batis*, came to sugar in June. At the end of the month this attraction fell off as the plants and grasses blossomed and a copious honeydew appeared. About the middle of August sugar was again worth trying, and fine varieties of the following species were taken:—*Triphana pronuba*; from pale grey (primaries) to dark, unicolorous chestnut (var. *innuba*). *Apamea oclea*: (1), *furca*, primaries dark brown, the lower half (or nearly so) pale grey, or, in other examples, coppery, with a broad waved band of the same shade parallel with the outer margin, beginning at the apex and continued to the inner margin; (2), "*rava*, brown across centre, base and hind margin paler"; (3), "*i-niger*, a distinct —like mark below the stigmata"; (4), "*leucostigma*, black, with distinct white stigmata." (Robson and Gardner's List, p. 17). *Xylophasia monoglyphæ* (*polyodon*): (1), grey, with black shades and wedge-like marks on primaries (an intermediate form); (2), "*infusata*, black, or nearly so." (Robson and Gardner). Other moths were *Mania maura* (local, but plentiful), *M. typica*, *Noctua rubi*, *N. xanthographa*, *Amphipyra tragopogonis*, *T. orbona*, *Xanthia cerago*, *Leucania lithargyria*, *Cidaria testata*, and *Alucita hexadactyla*. In September sugar drew *X. ferruginea* and *Anchocelis litura*.

But the captures at the city electric lamps were the great feature of the season. Moths were taken new as well as rare to the district. Foremost stands a fine female *Sphinx ligustri*, captured by Dr. Herbert Dobie on the night of July 15th—a new insect, although there is good authority for the occurrence of larvæ some years ago at Upton, three miles away. It may be interesting, as showing the range of this insect, to say there is equally good authority for the occurrence of the larvæ of this fine hawk-moth near Manchester, and at Grange, in North Lancashire. Dr. Dobie also captured a few specimens of *Eupithecia centaureata*, hitherto only recorded, as far as I know, for Wallasey and Bidston. *Mamestra persicariæ* appears in Mr. A. O. Walker's list as common in the larva state near Holywell, North Wales, on *Pteris aquilina*. This is the only district record I can find; but the moth appeared commonly enough here at the electric lamps, in July. *Notodonta dictæa* (hitherto only recorded for the Wirral and Holywell) was so common that it was frequently left as not worth the taking. Several specimens of *N. dictæoides* were captured, although the species is marked "scarce," and only at Bidston, about twenty miles away on the Cheshire side of the Mersey. I was from home during the greater part of July, but here is a list of a night's captures, kindly supplied me by the Messrs. Thompson, which is fairly representative of our July moths at the electric lamps up to the appearance of *N. dictæa* and *N. dictæoides* on the 19th. *Smerinthus ocellatus*, *S. populi*, *Euchelia jacobææ*, *Arctia caia*, *Spilosoma lubricipeda*, *S. menthastri*, *Porthesia similis* (*auriflua*), *Acronycta rumicis*, *X. monoglyphæ* (*polyodon*), *Triphæna pronuba*, *Phalera bucephala*, *Leucania pallens*, *Miana strigilis* var. *æthiops*, *Noctua rubi*, *Agrotis exclamationis*, *Hadenæ oleracea*, *Plusia chrysitis*, *P. festuæ* (first brood), *P. iota*, *Amphidasys betularia* var. *doubledayaria* (plentiful during the month, but all black forms), *Uropteryx sambucata*, *Abraxas grossulariata*, *Timandra amataria*, and *Spilodes verticalis*.

My method of capture was not to take a net, but wait for the moths settling on the ground or stonework about, and then box them. On reaching home I lifted the lid of each box a little, inserted a narrow strip of paper previously dipped in chloroform, and then closed the box. After all the boxes had been so treated, I took out the insensible moths, and killed them by sticking a sharp pin, dipped in a solution of oxalic acid, carefully between the front legs. The moths were then perfectly relaxed and ready for setting, but I kept them over night, as a rule, in a closed jar three parts filled with damp sand, on which was a layer of cotton-wool. Twelve or fifteen drops of carbolic acid were well mixed with the sand to prevent the formation of mould.

My captures for the next three months were the following:—

August. — *A. caia*, *P. similis* (abundant), *X. polyodon*, *Bryophila perla*, *T. fimbria* (hitherto a scarce moth), *T. ianthina*, *T. pronuba*, *T. orbona*, *L. cespitis*, *L. testacea* (some with almost black markings, others almost unicolorous pale brown), *Miana literosa*, *M. furuncula*, *A. oculatea*, *N. rubi*, *L. conigera*, *L. lithargyria*, *Neuronina popularis*, *S. populi* (one only, a large freshly emerged female, taken Aug. 23rd—surely representing a second brood), *P. gamma*, *Selenia illunaria* var. *bilunaria* (the summer brood, smaller and paler than the March form), *Crocallis elingvaria*, *Acidalia scutulata*, *Halia rauraria* (*wavaria*), *Ellopiæ fasciaria* (one; hitherto I have only taken it in Delamere Forest), *Eugonia* (*Ennomos*) *fuscantaria* (Entom. xxvi. 52), *Hypsipetes elutata*, *C. truncata* (*russata*), (with the variety *comma-notata*, "black," but with the median area of the primaries russet),

Melanippe fluctuata, *Eugonia alniaria* (tiliaria), *Platypteryx hamula* (new to the district; one, Aug. 11th; another by Dr. H. Dobie about the same date), *Scopula lutealis*, *Cataclysta lemnata*, *Tortrix ribeana*, *Scoparia mercurialis*, *Tinea tapetzella*.

September.—The moths began to thin off. *Amphipyra tragopogonis*, *Epunda lutulenta* (two, a male and female; a rare insect here). The "heat-wave" which had so marked the summer returned Sept. 5th, but the moths were only one each, on that date, of the following species:—*Ancho-celis litura*, *A. tragopogonis*, *E. lutulenta* (one of the two referred to; the other I took Sept. 1st), and *M. fluctuata*. Continuing the list:—*Hydræcia micacea* (one almost black), *P. festuæ* (second brood), *Tapinostola fulva*, *A. litura*, *Nonagria arundinis* (typhæ), *X. ferruginea*, *A. pistacina* with the following varieties: (1) "lineola, ferruginous, nervures distinctly paler"; (2) "ferrea, reddish, nearly unicolorous"; (3) "serina, pale yellow ochraceous, nearly unicolorous" (Robson and Gardner); *N. c-nigrum*, *Miselia oxyacanthæ* (with very dark forms), *Phlogophora meticulosa*, *M. fluctuata*, *E. fuscantaria*, *E. tiliaria*, *Thera variata*, *Depressaria ciliella*. Earwigs, spiders, caddis-flies, with an occasional beetle, which had all along come to the lights, now began to get scarce. On Sept. 2nd a fine full-grown larva of *Acronycta alni* was brought to me for identification. It had been found feeding on sycamore.

October.—*A. pistacina*, *P. gamma* (even to the end of the month), *Diloba cæruleocephala*, *H. micacea*, *Dasypolia templi* (one only, a fine fresh female, taken Oct. 8th; previous record, one specimen at Bidston Light-house), *P. meticulosa*, *M. oxyacanthæ*, *N. c-nigrum*, *Tethea retusa* (one, a fine fresh example, taken Oct. 24th; another was captured by Dr. H. Dobie. This species has not been previously recorded for the district, according to Mr. A. O. Walker's list).—J. ARKLE; Chester.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—November 2nd, 1898.—Mr. G. H. Verrall, Vice-President, in the chair. Mr. Ambrose Quail, of Palmerston North, New Zealand, was elected a Fellow of the Society. Mr. Merrifield exhibited some *Melitea aurinia* from Touraine forced and cooled as pupæ, the latter being much the darker and more strongly marked; some *Euchloë cardamines* from Sussex, those cooled having the apices of the wings darker and the discal spots smaller than those which have been forced; and some *Colias edusa* from eggs laid by two normal females taken in Savoy, two out of the five reared being of the var. *helice*; the marginal border of one male, which had been forced, was very pale and much suffused with long yellow scales. He also showed four *Papilio machaon*: two of them, forced as pupæ, had their dark parts very pale and their tails long and slender, the two which had been cooled having the dark parts much extended in area and darkened in hue, their tails being short and broad. These results, which were to be obtained with winter as well as summer pupæ, corresponded with those previously obtained by Dr. Standfuss. Mr. J. J. Walker exhibited two winter nests of *Porthesia chrysorrhæa* from the Isle of Sheppey, where the species had lately become very common. Dr. Mason exhibited a Buprestid larva found among Baltic

timber at Burton-on-Trent. This had been among wood in a box since the beginning of July last, and there was scarcely a trace of frass. Marsham had recorded the escape of a larva of *Buprestis splendens* from the wood of a desk in the Guildhall, which had stood there for more than twenty years. It is probable that the growth is extraordinarily slow, and consequently that the larva can maintain life for very long periods in most unfavourable conditions. Mr. Blandford called attention to similar cases which he had brought before the Society. It appeared likely to him, from what was known about such insects as *Callidium variabile*, which was occasionally bred from dry wood at long intervals, that these species were not abnormally slow-growing under normal conditions, but become so in dry timber, in which they probably sustained life with difficulty, especially when the outside of the wood was varnished. Mr. Waterhouse exhibited, for Mr. G. W. Kirkaldy, living examples in various stages of a *Cayoborus* in nuts of *Attalea funifera* from Brazil. Elditt had described the attacks of an allied species upon the seeds of *Cassia fistula*. Mr. Tutt exhibited, for Dr. Chapman a series of *Zygana exulans*, from Finnmark, and discussed the differences between them and the Scotch form. Papers were communicated by Mr. W. F. H. Blandford "On some Oriental Scolytidæ of economic importance, with Descriptions of five new Species"; and by Mr. van der Wulp (through Col. Yerbury) on "Asilidæ from Aden and its neighbourhood."

November 16th.—Mr. R. Trimen, F.R.S., President, in the chair. Dr. A. L. Bennett, Mission Protestante, Libreville, French Congo; Mr. J. G. McH. Gordon and Mr. R. S. G. McH. Gordon, of Corsemalzie, Whauphill, Wigtonshire; Mr. J. A. Kershaw, of Morton Banks, Lewisham Road, Windsor, Melbourne, Victoria; Mr. A. G. Lethbridge, of Glynde Place, Lewes; Mr. W. J. Lucas, B.A., of Minerva Road, Kingston-on-Thames; Mr. R. H. Relton, c/o Perkins and Co., Ltd., Brisbane, Queensland; and Dr. A. J. Turner, of Wickham Terrace, Brisbane, Queensland, were elected Fellows of the Society. Mr. Tutt showed, for Mr. Herbert Williams, a series of specimens of *Pararge egeria* bred from eggs laid in July. A portion of the brood were forced, and the imagos, which emerged in November and December of the same year, showed marked darkening of the hind margin of the under side of the hind wings, and were of a greyer colour than those which appeared at the normal time. He also exhibited a batch of fifty specimens of *Amphidasys betularia* bred from ova deposited by a female captured in Essex. The progeny ranged from a colour rather lighter than the normal form to a blackish tint almost equal to that of var. *doubledayaria*; all intergrades were represented without a sign of discontinuity. Mr. H. J. Elwes gave an account of a journey undertaken by him in June and July of the present year to the Russian portion of the Altai Mountains, partly for sport and partly to investigate the distribution of insects in that region, and the line of demarcation between the Eastern and Western Palæarctic subregions. He exhibited examples of 141 species of butterflies taken by himself. Of these many had not been previously recorded from the region, of which the total number of species now stood at 184; his list showed that the lepidopterous fauna had a more European and Siberian character than previously supposed, or than Seeböhm had found to exist in the

avifauna. The number of undescribed species taken was small, but several forms were previously known only from remote localities, such as *Melitæa iduna*, hitherto recorded from the fells of Lapland. Few Heterocera were taken, but among them was the third recorded example of *Arctia thulea*, Dalm. Dr. A. G. Butler communicated a paper "On some new species of African Pierinæ in the collection of the British Museum, with notes on seasonal forms of *Belenois*."—W. F. H. BLANDFORD, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 13th.—Mr. J. W. Tutt, F.E.S., President, in the chair. Mr. Russell, The Limes, Southend, Catford, was elected a member. Mr. Drury, F.R.H.S., presented a large number of Tortrices and Tineæ to the Society's collections. Messrs. Ashdown and Lucas presented numerous specimens of Dragonflies. Mr. Moore exhibited a series of *Polia chi* from Yorkshire; they were taken at rest on dark stone hedges, and were most conspicuous even from a distance. Mr. Fremlin, for Mr. Auld, eleven hybrids between *Pygæra curtula* and *P. anachoreta*, bred by Dr. Knaggs in April, 1898, together with typical specimens of both species for comparison. It was noted that the markings for the most part followed the female parent *P. curtula*. He also showed various races of the Tephrosias, *T. laricaria* and *T. biundularia*; a fine bred series of *Phorodesma bajularia* from the New Forest; specimens of *Zonosoma annulata* var. *obsoleta* from Devon; unusually dark forms of *Emydia cribrum*; a few *Eugonia autumnaria*, bred from a female taken at Folkstone; and a bred series of *Hemithea strigata* (*thymiaris*). Mr. Turner, a bred specimen of *Vanessa polychloros* from Horsham, much darker and comparable to some of those produced in Mr. Merrifield's temperature experiments. Mr. Kaye, a Syntomid moth, *Macrocneme lades*, from Venezuela, and a species of wasp which it mimicked. It had a remarkable development of the hairs on the long posterior legs. Mr. West, of Greenwich, specimens of the Hemipteron, *Ploiaria vagabunda*, from Reigate. Mr. Tutt read a paper entitled 'Scientific Aspects of Entomology.'

October 27th.—The President in the chair. Mr. Ashdown exhibited twenty species of British Longicorn Coleoptera, which he had brought to add to the Society's collections. Mr. Montgomery a specimen of the third brood of *Cyaniris argiolus*, bred Sept. 30th; specimens of three broods of *Selenia bilunaria*, of which the third brood followed the second; and bred specimens of a third brood of *Coremia ferrugata*. Mr. Mansbridge, two blue female examples and two underside vars. of *Polyommatus bellargus*. He remarked that the females of this species appeared to get more blue year by year. Mr. Dennis, pupa and cocoon of both *Charocampa elpenor* and *Sphinx ligustri*. Mr. Tutt, on behalf of Mr. Gordon, a considerable number of species taken in Wigtownshire: including *Saturnia paronia*, with much red on the hind wing; a pale-fawn *Smerinthus populi*; *Phalera bucephala*, with right fore wing dark; *Cænonympha typhon*, chiefly var. *rothliebii*; strongly banded *Pelurga comitata*; and others. Mr. Adkin, variable series of *Bryophila perla*, *B. muralis*, and *Botys flavalis*, to illustrate his paper entitled "Lazy Days by the Sea." A discussion ensued.

November 10th.—The President in the chair. The evening was devoted to a special exhibition of varieties, and was a most successful

gathering. Mr. Robinson exhibited, on behalf of Mr. A. H. Jones, of Eltham, specimens of the following species and varieties:—*Lycæna corydon*, a light-brown female; *Melanargia galatea*, an unusually perfect white band; *Argynnis paphia* var. *valesina*, with basal spots confluent; *Xanthia aurago*, nearly unicolorous; *Ephyra pendularia*, with red suffusion; *Thais cerisyi*, a melanic female from Armenia; and *Argynnis pales*, var. *arsilache*, from the Engadine. Mr. Robinson also exhibited gynandromorphous specimens of *Cleora lichenaria* and *Crocaltis elingvaria* from the New Forest. Mr. Chittenden, *Xanthia aurago*, bred, yellow, pink, and dark forms; *Anchocelis lunosa*, a red form and a black form; black forms of *Agrotis corticea* and *A. segetum*; *A. exclamationis*, red form; and a pair of beautifully marked *Tenioctampa incerta*. Mr. Williams, a long bred series of *Pararge egeria*, very brilliant in colour; and also a fine bred series of *Amphidasys betularia*, derived from ova of an ordinary female, and showing a strong melanic tendency, in some specimens almost reaching var. *doubledayiaria*. Mr. Mansbridge, *Cabera pusaria*, var. *rotundaria*, bred, from Kent. Mr. Edwards, *Abraxas grossulariata*, in which the white areas were closely dusted with fine black dots, and having the orange markings very intense. Mr. Rose, a fine series of *Xanthia aurago*, rich uniform red, bright canary coloured, and banded forms of all shades, from Reading. Mr. Butler, of Reading, *Stauropus fagi*, ordinary, dark, pale, and intermediate forms, together with specimens of a second brood; also exceptionally dark forms from an August pairing; a very dwarf captured *Luperina testacea*; *Xanthia aurago*, a series showing all the named forms, together with an undescribed pink form; and a greasy-looking form of *Vanessa io*. Mr. Tutt, specimens of a *Zygana* received from M. Oberthür, of Rennes, named by him *Z. palustris*, and apparently identical with the large form of *Z. trifolii* = *Z. trifolii major*, also a marsh-frequenting form; two cabinet drawers of British Argynnis and Brenthids for comparison with Dr. Chapman's exhibit of the same species; and a long series of *Brenthis pales* from various Continental localities. Mr. Pearce, a considerable series of *Bryophila perla* from Folkestone, among which were a good proportion of the leaden form. Mr. South, a bred series of thirty-five *Spilosoma lubricipeda*, var. *zatima*, and seven males of the type, from the same batch of *zatima* eggs; *Eubolia limitata*, light golden-brown forms, and very dark specimens; *Boarmia cinctaria*, a light form, bred from Irish ova; and *Hydræcia micacea*, bred from larvæ found in potato stems; the latter were sent to him by Miss Ormerod. Dr. Chapman, very long series of *Aglais urtica* and several species of European Argynnis, and read notes on their modifications in the various localities he had visited in Europe. Mr. Lucas, series of *Libellula quadrimaculata* and of *Calopteryx virgo* from his own and Rev. J. E. Tarbat's collection, showing great variation; the var. *prænubila* of the former species and three smoky males of the latter, from Surrey, were very noticeable. Mr. Nevinson, *Cleora glabraria*, very dark; *Fidonia clathrata*, almost unicolorous; *Acidalia contiguaria*, light and dark forms; *Fidonia atomaria*, male with female coloration; *Carpocapsa pomonella*, unicolorous pale form, bred from a walnut. Mr. Adkin, local forms of *Aplecta occulta*, some magnificent dark specimens; *Dianthæcia nana* (*consersa*), from all the chief British and Irish localities; and a drawer of Argynnis and

Brenthids. Mr. Moore, some grand under side forms of the leaf-butterfly, *Kallima inachis*; and a series of *Salamis antera*. Mr. West, of Streatham, *Vanessa atalanta*, without spots in the red marginal band of the hind wings; and *Catocala nupta*, with unpigmented streaks on the hind wings.—HY. J. TURNER, *Hon. Report. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—October 17th, 1898.—Mr. G. T. Bethune-Baker, President, in the chair. Mr. Wainwright exhibited a specimen of *Periplaneta australasia* from an orchid house at Forgan-denny in Perthshire, where it has been observed for three years now, and was causing a good deal of damage. Mr. Bradley showed *Andrena humilis* with its parasite *Nomada ferruginata*, from Sutton, where he had discovered a largish colony this year, the parasite being very numerous with its host. Mr. W. Harrison, insects from Witherslack, *Acronycta menyanthidis*, *Lycæna minima*, &c.; also *Callimorpha dominula* from the Stroud district, and other insects. Mr. G. H. Kenrick, *Lycæna arion*, from the Cornish locality, and other insects from the same place, including several fine examples of the var. *conversaria* of *Boarmia repandata*; *Acronycta ligustri*, *Lobophora sexualisata*, *Macaria alternata*, &c. Mr. J. T. Fountain, a collection of Lepidoptera made in the valley of the Wye above Tintern during six days' collecting last August bank holiday; it showed the locality to be rather rich, the insects including *Apatura iris*, *Thecla w-album*, *T. quercus*, *Drepana unguicula*, *Cerigo matura*, *Ephyra trilinearia*, *Cleora glabraria*, *Melanippe unangulata*, *Larentia olivata*, and many others. Mr. A. H. Martineau, a little lot of insects bred from bramble stems at Solihull, *Pemphredon lethifer*, Shuck., with its parasites, *Ellampus auratus*, L., and *E. æneus*, Fab. Mr. G. T. Bethune-Baker, two drawers of palæarctic Venessidæ.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

MANCHESTER MICROSCOPICAL SOCIETY.—October 20th, 1898.—In the Biological course in connection with the Mounting Section of this Society, the work mainly consists of demonstrations in comparative anatomy and histology. At the previous meetings the dissection of the larva and imago of the moth, and the preservation of lepidopterous larvæ, have been practically illustrated. This evening Mr. John Watson gave the first of a series of three demonstrations on the structure of the imago butterfly. Dealing with the general characters of a lepidopterous insect, he showed the distinction between them and those of the Coleoptera, Hymenoptera &c.; then proceeded to describe the appearance of the antennæ, palpi, and mouth parts, the legs and tarsal appendages, wings with reference to neuration, androconia and other secondary sexual characters, and the genitalia and anal tufts as found in so many of the eastern Pierids, pointing out the special features with regard to systematic classification. Reference was also made to the pouches of *Parnassius*; and the granular structure from which the pouch-forming fluid is secreted by the males of *Parnassius hardwickii* and *P. glacialis* was exhibited by means of the microscope. The demonstration was illustrated by specimens from Mr. Watson's collection, and a large number of microscopical preparations.—O. C. STUMP, *Hon. Sec.*

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